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A.M.A. CONVENTION • KANSAS CITY, MO. • MAY 11-15, 1936

Another Outstanding Number

LAST July (1934) we radically changed and greatly improved the "Medical Clinics of North America" in order to have them fill the specific needs of the general physician. Every number since then has been devoted wholly to the Clinical Medicine of General Practice.

The expediency of the change is well illustrated by the month-after-month "sell-out"—notwithstanding the fact that month after month we stepped up the number of copies printed until the September Number (just ready) is 83 per cent greater than July of last year.

Judging from the way in which new subscriptions are daily coming in to us this September Number, too, will be quickly sold out of print. It gives Clinical Medicine as developed and practiced today at the Mayo Clinic. And if you'll turn to Page 3 (Saunders Advertisement), you'll see at once why we predict another sell-out. There are 27 practical clinics in this one number alone—with 78 instructive illustrations. There are clinics on the vitamins, fever therapy, menstrual disorders, peptic ulcer, chronic ulcerative colitis, cervicitis, blood-pressure, bloodvessel diseases, and many other clinics on just those diseases so frequent in the practice of the general physician.

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INFANT FEEDING

HISTORICAL BACKGROUND AND MODERN PRACTICE

GROVER F. POWERS, M.D.
NEW HAVEN, CONN.

The subject of infant feeding seems somewhat hackneyed in these sophisticated days and perhaps for that reason more than any other needs occasional appraisal and reorientation. Toward this accomplishment the following discussion is offered.

HISTORICAL SUMMARY

Appreciation of the present status of the practice of infant feeding requires a view, even if fleeting, of the historical background of the subject. Prior to relatively recent times the successful practice of infant feeding consisted almost entirely in the use of human milk either from the mother or from a wetnurse. Animal milks, broths, pap, honey and wine were the principal food substances used in hand feeding and rarely led to the development of a healthy child if they were the exclusive sources of nutriment; i. e., unless also some human milk was given the infant.

When was the scientific basis of the present structure established? Various students would probably give different dates, but it would seem sound to select the latter half of the eighteenth century, the period when inaccurate but thought-provoking chemical analyses of milk were first being made. Prior to this period, for example, breast milk was tested by the finger-nail technic—a test that was still advocated in 1752, more than 1,600 years after it was described by Soranus of Ephesus, who flourished from 98 to 117 A. D.![1] Michael Underwood, who lived from 1736 to 1820, wrote a splendid treatise on the diseases of children, which was first published in 1784 and passed through sixteen editions; but not until the fourth edition, that of 1799, was any mention made of the chemistry of milk; this marked a real beginning for the scientific approach to the subject of infant feeding by the clinician. Still[2] says that with Underwood "paediatrics in England had crossed the Rubicon; the modern study of disease in childhood had begun."

The span of time in which a scientific basis for infant feeding has been emerging is thus probably less than 150 years. During these years developments in various fields of scientific and clinical inquiry have impinged on the subject, sometimes setting it off in one direction and sometimes in another but, taken together, establishing a sound body of knowledge and experience to guide the modern clinician.

It may be well to have at hand in outline form some of these scientific and clinical studies and stress their effect on infant feeding and on concepts of nutritional disorders:[3]

Chemical Studies.—The beginnings of milk analyses have been referred to, but the far-reaching effects of research in physiologic chemistry, notably the chemical analyses of foodstuffs under Justus von Liebig (1803-1873) and others, were manifested in the analyses of milk by J. Franz Simon, a chemist (1807-1843), in 1838 and later, and by Philip Biedert, a pediatrician (1847-1916), in 1869 and later. On these and other chemical studies was based the conception of the harmfulness of various constituents of cow's milk and the many attempts to imitate human milk as exemplified in numerous milk mixtures, now practically obsolete, and in the various cream and top milk mixtures. The so-called percentage method of feeding had its genesis in the work of Biedert but was brought to fruition by Thomas Morgan Rotch (1849-1914) in this country in the eighteen nineties. As Rotch has pointed out, percentage feeding is rather a method of calculation than a method of feeding; no one can satisfactorily prescribe food for an infant who does not have knowledge of the composition of that food. The use of "simple dilutions" of milk with added carbohydrate does not ignore composition but simply does not stress the importance of slight variations in the concentration of the individual constituents. It is probable that the mathematical intricacies of the "percentage method" may have driven some lazy physicians to the use of patent baby foods, but such foods were widely used before the percentage system of calculation was born.

Pathologic Studies.—The development of pathologic anatomy had its influence in the sphere of infant nutrition. One of the earlier workers in this field was the gifted French physician Charles-Michel Billard (1800-1832), who performed many autopsies on infants and attempted to classify disease according to the pathologic lesions. Other early attempts at classification of nutritional disorders "were made by the French pediatricians De Lord (1837) and Velikes (1838), who thought that the symptoms of vomiting and diarrhea were the result of an inflammatory condition of the digestive tract."[4]

Read before the Section on Pediatrics at the annual meeting of the Medical Society of the State of New York, May 14, 1935.

From the Department of Pediatrics, Yale University School of Medicine, and the Pediatric Service of the New Haven Hospital.

1. "That mylke is goode that is whyte and sweete; and when ye droppe it on your nayle and do not move your finger, neyther fleteth abrod at very stirring nor will hange faste upon your nayle, when ye turne it downward, but that whyche is betwene bothe is beste." (Still, after Thomas Phaer.)

2. Still, G. F.: The History of Paediatrics, London, Oxford University Press, 1931.

3. Brennemann, Joseph: Artificial Feeding of Infants, in Abt's Pediatrics, vol. III, Philadelphia, W. B. Saunders Company, 1923. Garrison, F. H.: History of Pediatrics, in Abt's Pediatrics, vol. I; An Introduction to the History of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1929. Levinson, A.: Pioneers of Pediatrics, reprinted from Medical Life, July 1928. Still.[2]

4. Abt, I. A.: Nutritional Disturbances of Infancy, in Abt's Pediatrics, vol. III, Philadelphia, W. B. Saunders Company, 1923.

In Germany, Herman Widerhofer (1832-1901) was a leader in studies of this type, which sought to find at the autopsy table some basis for disturbances in nutrition. By and large, this method of approach, except in a negative way, has not greatly clarified the problems of feeding and nutrition, although, as will be shown later, a correlation of postmortem observations with bacteriologic studies finally solved the etiology of bloody diarrheas in infants. So long as "the fundamental concept of disease remained fast-rooted in the anatomical lesion, the theory of treatment conscientiously limited itself to a number of drugs designed to combat that lesion" (Heubner).

Bacteriologic Studies.—The association of infant feeding with research in bacteriology has been close, and the contributions have been outstanding. Pioneer work in this field was done by Theodor Escherich (1857-1911) on the relationship of the colon bacillus to disease (1886). The most dramatic contribution was doubtless the demonstration by Duval and Bassett in 1902 at the Thomas Wilson Sanitarium in Baltimore that ileocolitis or bloody diarrhea in infants is really dysentery caused by an organism of the groups of bacilli described in part by Shiga in 1898 and by Flexner in 1900.

But infant feeding is perhaps under its heaviest debt to bacteriology for its gifts of pasteurization (begun first on a commercial scale in Denmark in 1890) and sterilization of milk and milk mixtures. By these means typhoid, dysentery, tuberculosis and streptococcic infections are specifically eliminated or reduced in incidence, and other infantile disorders of a nonspecific type have been controlled by the use of "clean" milk. For out of these early bacteriologic studies there emerged the campaign for "clean, pure milk," the establishment of Walker-Gordon Milk Laboratories (Boston, 1891), the introduction of certified milk by Coit of New Jersey in 1892, and the establishment of "consultations for nurslings" by Budin in Paris in 1892 and of "milk depots" by Variot in 1893 and Dufour in 1894.[5] The young pediatrician of today little realizes how much modern pediatrics owes to these early movements; the baby milk station with its complicated "feeding formulae" has gone, but pasteurization, sterilization, tuberculin testing and the infant welfare conference remain.

Metabolism Studies.—The fundamental work of Rubner set the stage for the great contributions of himself and Otto Heubner (1893-1926), who in 1894 built the first respiration calorimeter for infants. Heubner's contribution on the energy requirement of infants is basic to this day, along with similar studies by Benedict, Talbot, Fleming and Murlin. Without knowledge of the energy requirement of the infant, no scientific program for his feeding can be laid down, but there is no "caloric system of feeding" and, as Aldrich [6] points out, the calory is "a unit of combustion not of nutrition." Practical use of calculations of the energy value of milk mixtures did not get under way until well after the turn of the century.

A pioneer in the study of the metabolism of the child was Wilhelm Camerer (1842-1910), who in 1894 published important observations on the subject based on extensive personal observations. Studies in the field of infant metabolism continue to have a most important place in pediatric research.

5. Holt, L. E.: Infant Mortality, Ancient and Modern: An Historical Sketch, Am. Assn. for Study and Prevention of Infant Mortality, 4th annual meeting, Washington, D. C., 1913.
6. Aldrich, C. A.: Science and Art in Child Nourishment, J. Pediat. 1:413 (Oct.) 1932.

Clinical Studies.—With a background now somewhat extensive, valuable clinical correlations were attempted. Most noteworthy were those of Czerny and Keller in 1906 and Finkelstein in 1910. The classification of nutritional disorders by Czerny was attempted on an etiologic basis and consisted in a correlation of certain nutritional disorders with "too much" of certain food substances such as starch, fat or protein. Finkelstein's classification was purely clinical; he also had the conception of the harmfulness of "too much" of certain food substances, but he believed in the relative benignity of casein and fat and was inclined to blame the sugar and whey proteins and salts. This concern with the harmfulness of "too much" of some food ingredient gave way during the development of knowledge of vitamins to a phobia of the results of "too little" of some of the same or other substances or elements of the diet.

Czerny and others developed the conception of the effect on the gastro-intestinal tract of infections not in that organ. Enteral infections, so prevalent in the pre-"clean milk" days, have become less and less common, but infections elsewhere than in the intestinal tract (parenteral infections) as causes of nutritional disorders have received ever increasing emphasis.

Vitamin Studies and the Concept of Food Deficiencies.—Lunin in 1880 showed that a synthetic milk was not adequate for normal nutrition, and Eijkman in 1897 first produced experimentally a disease due to a vitamin deficiency—beriberi in pigeons. Since these studies, and particularly in the last twenty years, the contributions on the subject of vitamins have poured forth, important alike in number and content. But in addition, stimulated by the concept of disease resulting from absence of or "too little" of the vitamins, substances at that time unidentified, investigators became interested in ascertaining the effect of "too little" of many substances of known composition. Hence present day concepts of "too little" water and salts leading to shock and dehydration, "too little" protein to nutritional edema, "too little" iron to certain forms of anemia, "too little" of certain amino acids to stunting and death, "too little" calcium and phosphorus to skeletal defects; the illustrations might be extensively amplified. McCollum in 1932 stated that "there are at least thirty-seven individual substances essential for a complete diet. These consist of amino acids, linoleic acid, dextrose, minerals and vitamins." The figure would doubtless be raised today.

THE FORMULATION OF THE INFANT'S DIET IN MODERN PRACTICE

As the result of the knowledge of nutrition, which originated in diverse domains of science and in clinical observations and has been focused on the problems of infant feeding, the concept of the "balanced dietary" dominates the present era. It is largely to this aspect of modern infant feeding that I now invite attention—to the concept of the beneficence of "enough" of food constituents in contrast to that of the past of the harmfulness of "too much" or "too little." For the sake of completeness, most of the important items in the construction of the infant dietary will be mentioned, but only a few will be emphasized.

Energy Requirement.—The normal infant tends to satisfy his total energy requirement whether the milk mixture is concentrated or dilute. This requirement for the individual baby seems relatively rigid, whereas the total water requirement is somewhat labile, as is

evidenced, for example, by the fact that the water content of woman's milk is the same whether it nourishes children in the arctic or in the tropics. It would seem, then, that the physician in prescribing the infant's food should think first in terms of caloric requirement; it is one of the essential checks and balances in the determination of the dietary. Although the scientific measurement of the energy requirement of a relatively few infants has established the range to be between 90 and 125 calories per kilogram of body weight, in practice the reaction of the child to the calories given determines what additions or subtractions are to be made in a diet. In undernourished infants the estimation of caloric requirement is made on the basis of the weight to be expected if nutrition has been adequate. Earlier in the first year the infant requires more than later; the thin child and the active child require more than the fat, phlegmatic infant.

The Calory in the Assessment of Milk Mixtures.—The calory is not only a measure of the total energy requirement of the infant but a unit by which mixtures may be satisfactorily assessed and compared.[7] That is to say, a diet can be evaluated in terms of its total energy value and in the percentage of the total calories individually furnished by protein, carbohydrate and fat; the salt content can be expressed in terms of milligrams per calory, and so on with respect to the other ingredients of the food, whether they are amino or fatty acids, lactose, iron or iodine. Water content is thus related when caloric value per ounce or cubic centimeter is stated. Food appraisal on a gravimetric basis depends on the content of water and of various solid constituents of dissimilar qualities; the gram and the ounce have no meaning as units of nutritional currency. By contrast, the calory is a common measure of the energy yield of the total food and of the protein, carbohydrate and fat constituents separately as well; furthermore, the calory is an independent unit of evaluation and has physiologic implications. The amount of food ingested when the supply is not limited is not determined fundamentally by the gastric capacity (as was so dogmatically taught for years) or by the bulk of protein, carbohydrate, fat, roughage and water but rather, in large measure, by the energy yield of the food to the body.

Since the appraisal of a diet seems most significantly done in terms of the calory, it seems logical to express the known facts of nutritional requirements of individual food components in the same terminology. Thus, for example, it is usually stated that the breast fed infant receives an adequate amount of protein at the level of from 1.5 to 2 Gm. per kilogram of body weight; but this is possible only if the baby takes about 175 cc. of milk (about 120 calories) per kilogram of body weight. If the infant should take less, it might seem to follow that the food was at fault, since the child will receive less than from 1.5 to 2 Gm. of protein per kilogram. If, however, it is stated that the breast fed infant receives 8 per cent of his total calories, whatever their number, in protein, the important fact of the relationship of protein to other food constituents in the body is brought forward; the baby may take little or take much, but the fact that is thereby emphasized is the character of his appetite, not a seeming deficiency in his food. As will be pointed out later in this paper, the number of calories ingested, except in the case of the sick, feeble or premature infant, can be safely left to the baby when the supply of milk is adequate.

Protein.—The protein needs of the breast fed infant are apparently met when he receives in this food substance 8 per cent of his total calories. Since human milk protein is largely the complete protein, lactalbumin, and cow's milk contains a large amount of casein, which is not lacking but relatively low in an essential amino acid, cystine, it has been deemed advisable to give between 10 and 20 per cent of the total calories in protein when the source is cow's milk. This is from 3 to 6 Gm. per kilogram of body weight and is usually met by giving the infant about 100 cc. of milk per kilogram of body weight. But the minimum requirement of protein for the infant has not been determined. It has been taught in respect to the protein of cow's milk that a mixture in which 10 per cent of the total calories was in protein, 65 per cent in carbohydrates and 25 per cent in fat, i. e., ordinary sweetened condensed milk (developed by Borden in 1856), led to various nutritional disturbances; it was supposed that there was too little protein, too little fat and too much sugar. Dr. Harold Harrison of the department of pediatrics at Yale has just completed balance studies on five infants so fed and receiving cod liver oil and orange juice. It was demonstrated in these studies that the infants on this milk mixture showed as great a retention of nitrogen as they did when given an equal number of calories per kilogram of evaporated milk diluted so as to be equivalent to whole milk with 6 per cent of the mixture in added sugar; 15 per cent of the total calories yielded by this mixture was in protein. The retention of calcium and phosphorus was slightly lower in the babies on condensed milk than in those on the evaporated milk mixture but entirely adequate according to standards established by metabolic studies with breast milk. It is probable that the harmful effects of such milk mixtures in the past were due to excessive dilution and the lack of supplementary vitamins.

In a recent experimental study Smuts[8] has shown that in adult animals of different species, widely variant in size, the endogenous catabolism regardless of species is closely related to the basal metabolism, so "that 2 mg. of nitrogen are lost to the body daily for every calory of basal heat. . . . This estimate of the endogenous loss of nitrogen is the basic information necessary to compute the maintenance requirement of protein." This important investigation is basic for certain calculations by which experimental data are brought to bear on the matter of protein minimum. These calculations, while they must be based ultimately on data obtained from growing animals and babies, suggest that the protein of human milk is very nearly minimal in amount for the normal infant. Experimental proof may be obtained in this way of the clinical judgment of certain pediatricians that premature infants do better on human milk when that diet is supplemented with cow's milk protein.

In respect to the protein of cow's milk, it is not sufficient that it be adequate in amount and quality; it

7. For example, by determining the percentage of total calories in protein, carbohydrate and fat, it can be shown that seemingly dissimilar mixtures such as condensed milk, one-third milk with 5 per cent added sugar, and Schick's "dubo" (whole milk to which 17 per cent sugar has been added) have the same relative composition except for water content. Likewise, the similarity in the pattern of caloric percentage distribution of protein, carbohydrate and fat in butter-flour mixtures and S. M. A. to cream and top-milk mixtures and to human milk may be demonstrated. —Powers (footnotes 17 and 18).

8. Smuts, D. B.: The Relation Between the Basal Metabolism and the Endogenous Nitrogen Metabolism with Particular Reference to the Estimation of the Maintenance Requirement of Protein, J. Nutrition 9: 403 (April) 1935.

must be changed from its natural state. This process has been accomplished in a variety of ways. Budin[9] showed that the cooking of cow's milk greatly enhanced the value of the milk in the feeding of infants.[10] Similarly, investigators have fed milk which has been diluted, concentrated or dried, alkalinized, acidified, peptonized, treated with colloids by the addition of starch solution, acacia or gelatin,[11] with a growing realization that, however dissimilar some of these processes and however diverse the changes produced by them in the milk, one effect common to all is brought about such that when the milk is acted on by rennin the protein is precipitated in finer curds than is the case with raw milk. The degree of fineness varies with the particular method of denaturization used. It is believed that this change in the protein largely accounts for the favor which milk so modified has found in the feeding of infants.

Fat.—From the standpoint of facility of caloric supply, it is desirable to have fat in the food. Why are fats otherwise desirable? The answer to this question is incomplete. The fats are associated with certain vitamins and previtamins, but these are now available in fat-free concentrates or other forms. During the great war, Pirquet observed many children who received little fat in their food. As the result of von Groer's experiments in Pirquet's clinic, it was believed that fat could be entirely eliminated from the diet. However, the infants von Groer studied can hardly be said to have done well. Burrs' work suggests that certain unsaturated fatty acids—linoleic and linolinic—are essential but interchangeable in the body economy. The fats are intimately associated with water, mineral, phospholipid and sterol metabolism. There is, therefore, suggestive evidence that, ordinarily, cow's milk should not be so modified for infants that fat is completely removed. On the other hand, clinical experience supports the belief that a large amount of butter fat is not handled well by most infants artificially fed and that about 20 to 30 per cent of the total calories (from 2 to 3.5 Gm. per kilogram of body weight) in fat is an optimum amount.

Recent studies on fat metabolism in infants are of great importance. Holt, Tidwell, Kirk, Cross and Neale[12] have shown that the "size of the fat particles is without influence on fat absorption" and that "volatile fatty acids in amounts considerably larger than those present in butter appear to be harmless." Both of these observations are contrary to much previous teaching. Two further conclusions of Holt and his associates are of practical import: The first of these is that "a comparative study of various fats and fat mixtures indicates that those mixtures specially designed for infant feeding are no better absorbed than butter. Certain animal and vegetable fats are, however, distinctly better absorbed." The other conclusion referred to is that "fat-poor diets tend to produce loose, fermentative stools"; at times such diets "appear to bring out allergic manifestations" (eczema and spasmodic bronchitis).

Hansen[13] has brought forward evidence that certain cases of eczema are favorably influenced by the addition of oils containing large amounts of unsaturated fatty acids (corn oil and linseed oil). Since these patients showed low values for the iodine number of the fatty acids of the blood serum and the low iodine numbers could be raised by administration of the oils referred to, Hansen ascribes the favorable effect to a greater need of these patients for certain unsaturated fatty acids.

Carbohydrates.—In regard to carbohydrates, clinical experience has demonstrated that additional amounts should be added to the carbohydrate in the milk. Indeed, one observation seems very clear; namely, that if the protein, mineral and vitamin contents of the food are satisfactory the carbohydrate content may with safety reach proportions commonly practiced only by the use of sweetened condensed milk. The harmful effects of that food are now recognized to be due not to the high carbohydrate content per se but to lack of vitamins and, as often used, to excessive dilution.

Lactose, sucrose from cane, beet or banana, levulose in fruit juices and in honey, dextrose, maltose, dextrins and starches all have a greater or less place in infant feeding. Differences in cost, taste, digestibility, rates of absorption, osmotic pressure, and nutrient influence on bacteria are some of the points on which one should like exact data so that the optimal carbohydrate or combination of carbohydrates might be selected for the infant. Unfortunately, as Marriott points out, "there are few, if any, carefully controlled clinical observations on the intestinal tolerance to the various sugars and most of the statements made appear to be based only on general impressions."

Too much emphasis has been placed on the fact that the milk sugar of all animals is lactose. Since the sugar ultimately utilized by the body cells is dextrose, there could be no accumulation of that sugar in a secretion such as that of the mammary gland. But why lactose is excreted in milk rather than some other carbohydrate is not known. The question presents itself Is there a minimal requirement for lactose? Pertinent data such as these may be given: that lactose, because of prolonged acid fermentation, favors calcium absorption, and that a lactose derivative—galactose—enters into the structure of the glycolipins of nerve tissue. If milk is the basis of the infant's food, the lactose so given almost certainly meets the minimum requirements for that substance. The matter then becomes of importance only in the construction of milk-free foods for infants, a problem of growing interest to pediatricians.

The advantages of a mixture of added carbohydrates, when any but small amounts are used, probably rests on solid ground. Since a variety of enzymes are required for the digestion of a variety of carbohydrates, the absence or reduction in amount of any specific enzyme will likely be associated with less digestive disturbance if this food element is fed as a mixture of

9. Budin, Pierre: The Nursling; translated by William J. Maloney, London, Caxton Publishing Company, 1907.

10. Soxhlet introduced the practice of cooking of milk in Germany in 1886 and Budin and Chavane in Paris in the eighteen nineties. When the practice actually began is not known. Bartholomäus Metlinger (late fifteenth century) advocated the boiling of milk; he, like many other writers, probably advocated the procedure because it was observed that raw milk was more laxative than boiled milk. After the development of bacteriology, boiling was practiced to inhibit the growth of bacteria. It was not until the work of Brennemann (A Contribution to Our Knowledge of the Etiology and Nature of Hard Curds in Infants' Stools, Am. J. Dis. Child. **1**: 341 [May] 1911; Boiled vs. Raw Milk: An Experimental Study of Milk Coagulation in the Stomach, J. A. M. A. **60**: 575 [Feb. 22] 1913), and Ibrahim, about 1911, that it was clearly recognized that boiling accomplished two distinct purposes: it made the milk more digestible and it freed it from living bacteria. I believe that all cow's milk used in feeding infants should be boiled or otherwise cooked to an equivalent degree.

11. An old procedure advocated by Underwood and the elder Meigs and by many others in recent years.

12. Holt, L. E., Jr.; Tidwell, H. C.; Kirk, C. K.; Cross, Dorothea, M., and Neale, Sarah: Studies in Fat Metabolism: I. Fat Absorption in Normal Infants, J. Pediat. **6**: 427 (April) 1935.

13. Hansen, A. E.: Study of Iodine Number of Serum Fatty Acids in Infantile Eczema, Proc. Soc. Exper. Biol. & Med. **30**: 1198 (June) 1933; Serum Lipid Changes and Therapeutic Effects of Various Oils in Infantile Eczema, ibid. **31**: 160 (Nov.) 1933.

small amounts of several carbohydrates rather than as a large amount of a single sugar or starch. Moreover, under such circumstances the availability of the products for absorption is spaced, the varied influences on bacteria and yeast of different nutrients are achieved, and the hydragogic effect of the milieu is lessened. It is demonstrated by clinical experience that small amounts of starches, even in calorically valueless amounts, before the infant is 6 months of age, are desirable in the modification of milk; a finer curd and a more demulcent mixture, as well as other less tangible qualities, are achieved thereby.

Laxative effects are probably promoted by increasing the relative proportion of malt sugar over others, but it is important to recall in this connection that many of the commercial products containing maltose are mixtures not only of sugar and starch derivatives but of salts and other substances largely unidentified, which may well cause the laxative action.

It must be emphasized that dextrose is an essential requirement of the animal organism; the minimal amount "necessary for the maintenance of life and the prevention of ketosis is approximately 3 Gm. per kilogram of body weight per day in the case of young infants." [14] This amount is about 12 per cent of the total calories for infants. However, if sufficient calories are ingested, the proportion that can be given in fat is too small to bring about ketosis; the use of carbohydrate in large amounts in the infant's diet really rests on successful clinical experience.

Vitamins.—In the various procedures concerned in the modification of milk it has been appreciated that the end product is comparatively poor in vitamins C and D and that the diet must be supplemented as a routine with respect to them. Most pediatricians believe that the A and the B complex are present in adequate amounts in milk. However, in respect to vitamin B, special consideration seems required in certain cases. Vitamin B is a fundamental necessity for metabolism. Cowgill has demonstrated that the requirement for this vitamin is directly proportional to the total metabolic rate; while a certain amount of the vitamin may be stored, starvation depletes the supply. Cowgill has also shown that the vitamin B requirement of dogs is generally increased when the animals are given large amounts of water. These facts may be pertinent in the case of infants who are convalescent from a severe diarrhea with dehydration and who have been starved and given large quantities of fluid. Vitamin B in some concentrated form may thus be a desirable addition to the diet of convalescent infants.

Of great concern to the pediatrician is the use of vitamin and salt fortified foods and the various vitamin and salt mixtures. Adequate data on the potency and effectiveness of most of these substances are lacking. Furthermore, physicians may well be concerned with the possible harmfulness of many of these well advertised preparations of vitamins, iron, copper, iodine and the like and the nullifying effect of one on the other. The public health aspect of this whole matter and its relation to food advertising is one that challenges the best thought of every physician and especially of those to whom authority and decision in such matters have been delegated.

Water.—In infant feeding, water should be regarded in its true light; namely, as one of the essential structural elements of the body. Water is necessary also in the regulation of temperature and in the assimilation and elimination of metabolic products. Water has a value in promoting greater ease in the digestion of cow's milk, but it is misleading to think of this as the primary function of water, as is so often done in speaking of the dilution of milk mixtures.

The water requirement of the infant is greater than that of the adult, since the requirement is roughly proportional to the total energy metabolism; many other important factors are involved, such as external heat and humidity, muscular activity, and the salt and nitrogen content of the food. The breast fed infant receives from 125 to 150 cc. of water per kilogram of body weight irrespective of many of these factors; this is the pediatrician's guide, but there must be a wide margin of safety in this quantity. Schoenthal [15] found that in the artificially fed infant receiving from 35 to 60 cc. of water per kilogram symptoms of acute dehydration developed; this suggests a minimum requirement of water for the artificially fed infant. Whether most of the water should be given with the milk mixture is to be determined in the individual case, but some water as a matter of habit training should be given alone between some feedings.

Salts.—In practice the necessary inorganic material is adequately cared for if the amount of protein in the milk mixture is adequate. The exception is iron, which in the case of the premature infant may perhaps be augmented.

RULES FOR DEVISING FORMULAS

In developing the formulas by which satisfactory milk mixtures may be prepared, various conceptions and rules have obtained; the mixtures evolved will be shown (chart 1) to have many similarities regardless of the method by which their composition was determined.

Some of the bases of the formulations may be described:

1. The approach of Meigs, Biedert and Rotch. By various means, a milk mixture is devised that has approximately the same percentage of protein, carbohydrate and fat as has human milk. In this group are the cream and top milk mixtures and the butter-flour mixtures; also certain prepared foods such as Synthetic Milk Adapted (S. M. A.), Lactogen and Similac. To this group belonged many laboratory prepared milks now obsolete (item 1, chart 1).

2. Budin's rule. The French obstetrician Budin,[9] who made splendid contributions to pediatrics, advocated the use of whole cow's milk in the feeding of infants but insisted that the milk be sterilized. Budin estimated the amount of milk to be given as one tenth of the body weight. There is no doubt that sterilized whole milk can be successfully used in infant feeding, but many children do not thrive on it; Czerny observed such children and believed that many suffered from milk injury (milchnährschadung). The modern conception of the "injury" is that it is due to too little sugar rather than to too much milk. Budin sometimes added carbohydrate to the diet (item 2, chart 1).

3. Another European rule, devised by Pfaundler, is as follows: "Take the tenth part of the infant's body weight in cow's milk and add to it one one hundredth of its body weight in carbohydrate, not exceeding, how-

14. Marriott, W. M.: Infant Nutrition, St. Louis, C. V. Mosby Company, 1930.

15. Holt, L. E., and Howland, John: Holt's Diseases of Infancy and Childhood, revised by L. Emmett Holt Jr. and Rustin McIntosh, ed. 10, New York and London, D. Appleton & Co., 1933.

ever, 50 grams a day: add water to make 1 liter. Divide into five feedings and let the child take as much at each feeding as it will." [16] Most milk mixtures made up according to this rule are simply whole milk with 10 per cent added carbohydrate plus varying amounts of water (item 3, chart 1).

4. Holt Sr. and many others determined the amount of milk to be used in a milk mixture on the basis of

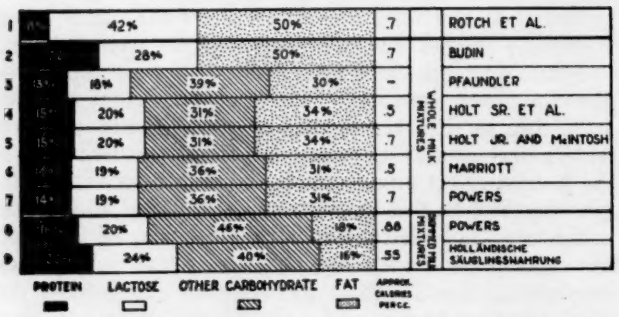

Chart 1.—The percentage distribution of the total calories in protein, lactose, added carbohydrate and fat in milk mixtures made up according to the following rules:

1. Cream and top milk mixtures of Biedert and Meigs, the "percentage" mixtures of Rotch (1893), S. M. A. of Gerstenberger (1915-1919) and butter-flour mixtures of Czerny and Keller (1918).

2. Budin's feeding: one tenth of body weight in sterilized whole milk; no added water or carbohydrate (usually).

3. Pfaundler's rule: one tenth of body weight in boiled milk to which is added one one hundredth of body weight of carbohydrate; water added to make 1 liter.

4. Common type of mixture used by Holt Sr. and many others: based on rule that, in order to give adequate protein, 100 cc. of whole milk per kilogram of body weight is required; necessary calories made up in added carbohydrate; water added so that (in early months) 200 cc. of fluid per kilogram is prescribed.

5. Standard milk mixture suggested by Holt Jr. and McIntosh (1933). The mixture is isocaloric with human milk, but amount of milk is determined as in 4.

6. Marriott (1930) bases simple mixtures on rule that quantity of milk should be 100 cc. of whole milk per kilogram of body weight and amount of added carbohydrate should be one eleventh of the milk. Water is added in varying amounts to provide fluid intake from 200 cc. per kilogram in early months to 140 cc. Relatively less water is added to evaporated and acidified milk mixtures.

7, 8 and 9. The author in 1925 pointed out that a simple basis for preparing milk mixtures is to provide two thirds of the total required calories in milk and the remainder (one third) in added carbohydrate. Water is added to the mixture on the basis of the fluid intake if the infant was exclusively breast fed. The rule holds whether whole milk (7) or partially skimmed milk is used. The diagrams show the caloric percentage distributions in one-half skimmed milk mixtures both simple (8) and in the traditional buttermilk, sugar, flour mixture so frequently used in the Netherlands.

a requirement of 100 cc. per kilogram of body weight. This amount of milk would supply about 3.5 Gm. of protein per kilogram—the basis of the rule. The required number of calories was made up of added carbohydrate; water, in the early months, was added to provide 200 cc. per kilogram of body weight. The resulting mixtures were essentially those so long and stedfastly advocated by Abraham Jacobi (item 4, chart 1).

5. The "standard" mixture of Holt Jr. and McIntosh [15] is isocaloric with human milk and is based on the same requirement of protein as in the preceding rule; the amount of water added is less, however (item 5, chart 1).

6. Marriott [14] in his textbook recommends that the quantity of milk used should be 100 cc. per kilogram of body weight and to this should be added carbohydrate in the amount of one eleventh of the milk. Water is added so that the milk mixture supplies about 200 cc. of fluid per kilogram of body weight in the early months and 140 cc. later. Marriott advocates much less water if evaporated milk or acidified milk is used (item 6, chart 1).

7. I [17] pointed out in 1925 that the majority of successful milk mixtures yield 10 to 20 per cent of the total calories from protein, 15 to 30 per cent from fat and 50 to 70 per cent from carbohydrate. This percentage distribution of calories is pretty closely approximated in mixtures if two thirds of the total calories is supplied in milk and one third in added carbohydrate; the rule holds good whether whole milk or partially skimmed milk is used. If whole milk is used, water may be supplied so that the intake is about 140 cc. per kilogram of body weight (items 7, 8 and 9, chart 1).

If milk mixtures for an infant are constructed according to these rules and are then analyzed according to the percentage distribution of the total calories in protein, carbohydrate and fat, it will be found, as shown in chart 1, that the mixtures are strikingly alike with the exception of whole milk (item 2), rarely used, and the mixtures that have the same caloric percentage configuration of protein, carbohydrate and fat as has human milk (item 1). The latter foods include cream and top milk preparations, butter-flour mixtures, Synthetic Milk Adapted and various patent milk preparations. Naturally, the concentrations of the mixtures vary because different amounts of water may be added according to the various rules.

In practice, therefore, it does not matter which of several rules the physician follows; in the end he will give most of his patients a food containing from 10 to 20 per cent of the calories in protein, not more than 35 per cent in fat and the remainder in carbohydrate—at least 50 per cent. The actual concentration will vary according to the individual child; the infant with an irritable gastro-intestinal tract usually does better with relatively concentrated mixtures, and water must be given between feedings. A very satisfactory mixture is made by adding 10 per cent sugar to half skimmed

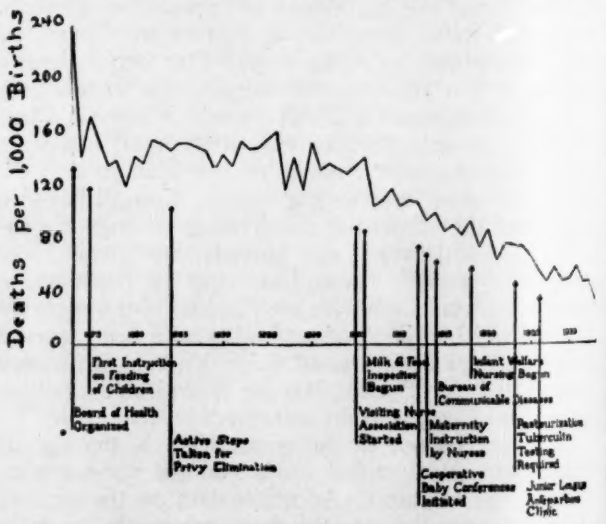

Chart 2.—Infant mortality in New Haven. The author is indebted to Prof. Ira Hiscock of the Department of Public Health in Yale University for this chart.

milk (item 8, chart 1). This mixture usually requires no added water and is not too concentrated for the average infant; if made from sour milk it resembles closely the Holländische Säuglingsnahrung (item 9, chart 1), excepting that the latter is less concentrated and contains some starch.

In this connection, the use of the milk of the ass is of interest. This milk has long been popular in infant

16. Feer, Emil: Textbook of Pediatrics, first English edition, translated by Julius Parker Sedgwick and Carl Ahrendt Scherer, Philadelphia, J. B. Lippincott Company, 1922.

17. Powers, G. F.: Comparison and Interpretation on a Caloric Basis of Milk Mixtures Used in Infant Feeding, Am. J. Dis. Child. 30: 453 (Oct.) 1925.

feeding. Parrot in the eighteen eighties not only used ass's milk but practiced direct nursing from the animals, which were quartered close to the nursery of the hospital. Attention is here called to the subject because of the fact that the ass is the only animal whose milk shows the caloric percentage pattern just described as that which seems to meet the nutritional needs of most infants satisfactorily.[18] The caloric value of this milk is low, however: 0.45 calory per cubic centimeter.

INFANT MORTALITY

Every one is aware of the fact that there has been a tremendous reduction in mortality and morbidity from nutritional disorders of infancy. There has also been a downward trend in the total death rate from all causes; but the lowered death rate for children is so great that it accounts for a substantial portion of the total reduction. Attention is called to chart 2, showing the curve of the infant mortality rate in New Haven since 1875, correlated in time with various developments in public health. The infant mortality trend for New Haven is typical of that of most other cities in this country and Europe. It would seem that the sharply downward trend of the curve began about 1895. Prior to this time the outstanding developments in public health had to do with the establishment of water supply and the disposal of sewage. It was in the eighteen nineties, however, that the various chemical, bacteriologic, vitamin and clinical studies which have been described were in full swing and were beginning to bear fruit through their application by various public health measures to large numbers of infants. Adequate training in pediatrics has been given only in the last two or three decades. No striking correlation of the curve of infant mortality with any individual scientific or educational development seems possible, but there is probably a summation effect of many factors forcing the curve downward.

Mortality Statistics from Data of Grulee, Sanford and Herron

Group	Number of Infants	Mortality per 1,000 Infants: General	Respiratory Infections	Gastro-Intestinal Disturbances	Miscellaneous Infections
1. Breast fed	9,749	1.54	0.41	0.20	0.72
2. Partially breast fed	8,605	6.86	5.11	0.70	2.91
3. Artificially fed	1,707	84.36	48.04	8.20	19.33
Total	20,061	11.00	6.50	1.10	3.20
Ratio of mortality in group 1 to that of group 3		1:56	1:115	1:40	1:27

The question may fairly be posed Are all the problems of infant feeding solved? The answer without much doubt is "No."

The recent contribution of Grulee, Sanford and Herron [19] is of great significance. (The accompanying table is prepared from the data of Grulee, Sanford and Herron.) Their study shows a striking disparity in mortality in a group of 9,749 infants wholly breast fed for nine months compared with that in a group of 8,605 infants only partially breast fed and in still another group of 1,707 infants wholly artificially fed. The mortality in the first group was 1.5 per thousand, in the second 6.8, and in the third 84. The mortality from various causes is shown in the table to be relatively greater, especially in the artificially fed group, from respiratory infections than from "gastro-intestinal disturbances." This probably means that the latter, in the sense of severe diarrhea and vomiting and marasmus, cause fewer deaths than more subtle nutritional disorders, which lead to greater susceptibility to infections: rickets, at least in former times, was such a nutritional disease.

It is probably true that unintentional selection was operative and threw into the class of artificially fed infants those who were in poorest health and whose mothers were least cooperative and attentive. However, it should be noted that all the infants received good medical and nursing supervision through infant welfare conferences, as is probably indicated by the fact that the total mortality in the group of 20,061 infants was 11 per thousand, whereas the total mortality for infants of this age period in Chicago was about four times that figure. Making allowance for selection and for errors inherent in statistical analyses of this kind, this study demonstrates that the practice of breast feeding is more successful than the practice of artificial feeding.

Specific limitations in artificial feeding present themselves for further study. What is the best method of feeding the premature infant and of controlling rickets and anemia? Should the diet be enriched in any respect after acute illness and how? What further studies can be made of the relation of food ingredients to gastro-intestinal rhythm? What further can be discovered about the relation of the hyperirritable gastro-intestinal tract to the autonomic nervous system? What is the relation of diet to the production of celiac symptoms, to disorders of the pancreas and to infections?

PSYCHOLOGIC ERA [20]

It would appear, however, that in this field the most serious problem facing the physician at the present time has to do with the emotional life of the infant and mother; physicians are practicing and will continue to practice for some time at least in what might be termed the psychologic era in infant feeding. The available data concerning nutrition are doubtless fundamentally sound, but in applying the facts in the feeding of the infant his emotional life and that of his mother must be taken into consideration or else psychologic factors may become so disturbing that good nutrition is not attained. It is certain, in respect to the future of infant feeding, that the pediatrician must think not less in terms of principles of nutrition but definitely and decidedly also in terms of the personality of the child and of those in his immediate environment, especially, of course, of the mother.

Behavior problems seem at first glance to present themselves acutely, persistently and in great numbers in children at an older age period than that connoted by the subject of "infant feeding." But these problems of the preschool and school child express in a more

18. Powers, G. F.: The Alleged Correlation Between the Rate of Growth of the Suckling and the Composition of the Milk of the Species, J. Pediat. **3**: 200 (July) 1932.

19. Grulee, C. G.; Sanford, H. N., and Herron, P. H.: Breast and Artificial Feeding: Influence on Morbidity and Mortality of Twenty Thousand Infants, J. A. M. A. **103**: 735 (Sept. 8) 1934.

20. The author has been greatly aided in this discussion by the articles on this theme by Drs. Brennemann and Aldrich[6] and by many stimulating discussions with Dr. Marian Putnam, assistant professor of psychiatry, and Miss Ruth Washburn, Ph.D., assistant professor of child development, Yale University School of Medicine. Brennemann, Joseph: The Menace of Psychiatry, Am. J. Dis. Child. **42**: 376 (Aug.) 1931; Vis Medicatrix Naturae in Pediatrics, Tr. Am. Pediat. Soc. 42d annual meeting, Montreal, July 1930; Psychologic Aspects of Nutrition in Childhood, J. Pediat. **1**: 145 (Aug.) 1932; Pediatric Psychology and the Child Guidance Movement, ibid. **2**: 1 (Jan. 7) 1933. Aldrich, C. A.: Cultivating the Child's Appetite, New York, Macmillan Company, 1928; footnote 6.

mature pattern emotional reactions the basis for which was established in infancy; the expression will be different at various intellectual and motor levels, but the underlying psychologic disturbance may be much the same.

Even in breast feeding there arise emotional problems. There are some infants who seem to be "breast shy," even when the mother has plenty of milk; such infants will not suckle although they will take the bottle willingly. There are other infants who never nurse or eat well; constitutionally they seem uninterested in food, although the possibility of a conditioned antagonism and negativism cannot be excluded. Another source of difficulty is the transition from the maternity ward to the home. The mother at home has more cares, more distractions and worries; her milk lessens, the baby cries, the mother gets more anxious and tense and a vicious circle is established. The mother and baby are now the center of a severe emotional storm which, in a majority of cases, could have been prevented had the physician had sufficient insight, understanding and patience to prepare the mother for what might happen.

The psychologic factors play a more important rôle, however, in artificial feeding. In the past, emotional difficulties were not recognized as of major importance since they seemed to be present only in isolated cases, but now these problems are widespread, constituting a major portion of the practice of many pediatricians. The reasons for this increase are many; the problems are sequelae, in part—possibly in large measure—of a strict, dogmatic attitude in the application of the advances in the science of nutrition to the practice of infant feeding; pediatrician and mother alike have the "itch" for regulation growing out of aspirations for perfection in dietary regimen and habit training and as a direct result of the propaganda for weighing and measuring—in short, for standardization. In commenting on the percentage method of feeding, Jacobi once remarked caustically that "feeding cannot be regulated by mathematics so well as by brains, and by the wants of the individual child." Today he would probably say that "you cannot by laboratory methods feed babies on 'thirty-seven individual substances essential for a complete diet'; the baby and the attitude of his mother have something to do with what is ingested even if they are ignored as to what is prescribed."

The successful experiment of Dr. Clara Davis [21] in Cleveland and Chicago of allowing infants of weaning age [22] to exercise choice in the amount and kind of food that they might eat constitutes a most challenging piece of work. It should remind the pediatrician that the normal breast fed infant, while he has no choice as to the kind of food he receives, is not regulated as to the amount nor strictly, in the unsophisticated home, as to meal time; his hunger cries are usually rewarded and the clock is often ignored. The artificially fed infant, on the contrary, is much more strictly limited as to quantity and meal time; his appetite is almost totally disregarded. When in the usual course of events such a carefully regulated infant is offered solid food at about 5 or 6 months of age he may rebel; the mother, owing to the uncompromising attitude which the preceding six months' strict regimen has engendered, becomes disturbed and anxious. Instead of taking a purely passive attitude the mother becomes tense and aggressive and attempts forced feeding, and there follow the inevitable consequences—refusal of food, vomiting, sleeplessness, querulousness. Over and over again one can date the beginning of behavior problems of later infancy and of the preschool period to the time when solid food was introduced into the dietary regimen. The mother who has been narrowly trained in the precision of regular hours and measured amounts of carefully prepared milk mixtures is totally unprepared to handle the first act of rebellion.

Similar situations arise when weaning occurs precipitately in later infancy, when cup or spoon supplant bottle and when too aggressive attempts are made in the giving of orange juice or cod liver oil, and in establishing strict regularity in habits of sleep and elimination. Less emphasis on regularity and quantity, more elasticity in the care of the child, casual, early acquaintance (i. e., before 3 months for most of the objects and substances listed) with the rubber nipple, spoon and cup, water, orange juice, cod liver oil, solid food—all of this for the sake of training as well as for intrinsic merit, and, above all, education of the mother to utter passivity in the presence of evidences of nonconformity will usually prevent difficulties of an emotional nature. It is obvious that emphasis is being made here less on infant feeding per se and more on the attitude and training of the mother.

Of course, there are many other factors in the background of these emotional disturbances—the fundamental make-up of the child, racial stock, the small family with excessive concentration of attention on one or two children, the tension and complexities of modern life, thwarted social and economic ambitions, the desire to "keep up with the Joneses" in respect to the handling of infants as in everything else. Undoubtedly most parents expect too much of their children, especially of the first born.

This approach to the problem in which the education of the mother concerning the emotional as well as the physiologic reactions of the infant to the nutritional elements in his diet may bring forward the criticism that the child will be undisciplined, "spoiled." The criticism is perhaps largely academic, if the conception under discussion has been adequately presented. There are a sufficient number of required conformities even in an infant's life to insure the development of reasonable discipline. Some things in infant feeding are clear cut, definite, certain; there are others which permit wide latitude for wise and sympathetic interpretation. For example, there is no basis in physiology for giving every 10 pound (4.5 Kg.) infant exactly 500 calories of a milk mixture which is to be given in exactly 6 ounce (170 cc.) doses every four hours by the clock with one feeding omitted. However, it is reasonable to consider that the average 10 pound infant would require about 500 calories and should not be urged to take that number if not hungry nor forbidden to take more if hungry. Perhaps at some feedings he will want more than 6 ounces and sometimes less; he may want some feedings at six hour intervals and some at three. No plea is being made for irregularity for irregularity's sake, but a protest is being made against inflexible standardization for its own sake. It would be wise for the physician to worship the baby more and the measuring stick, the scales, the graduate and

21. Davis, Clara M.: Self Selection of Diet by Newly Weaned Infants, Am. J. Dis. Child. **36**: 651 (Oct.) 1928; Self Selection of Diets by Infants, ibid. **40**: 905 (Oct.) 1930.

22. Dr. Davis in a personal communication to the author has recently described a similar study (to be published) "with three breast fed infants taken from lying-in hospitals at the ages of 10, 8 and 7 days respectively and kept continuously on the experiment for periods of seven and one-half to eight months." The results of the study are strikingly in accord with those obtained with the older children.

the clock less; there was a time not so long ago when the infants' stools would have been included in this interdicted list.

If a battle impends in the handling of the child, the conflict must be won by strategy and not by force—a weapon that has so small a place in the armamentarium of the pediatrician as to be always invisible and rarely used; the ingestion of food never can be actually forced. As with the horse, you can lead a baby to water but you cannot make him drink. Food swallowed unwillingly by means of such tricks as bribing or diversion is often vomited.

CONCLUSION

It should be clearly understood that while I believe that the importance of an understanding of the emotional aspect of the feeding of infants is too little appreciated and that the chief problem at present arises in this domain, no real achievement in the newer knowledge of nutrition is thereby ignored. The most important aspect of the emotional problem in infant feeding is recognition that the problem exists and to a large degree may be prevented if the physician has insight and understanding of the personality of the mother and takes pains to prepare her to meet situations that are bound to occur in every case. The physician may need the assistance of a psychologist or a psychiatrist or both in therapy, but the burden of prevention is wholly that of the physician who guides the feeding. Here, if anywhere, "an ounce of prevention is worth a pound of cure." But prevention means understanding, insight, tact and patience. The physician must have all these qualities, and he must devote a great deal of time to the handling of these cases. Our psychiatrist, Dr. Marian Putnam, tells me that her most serious cases are those in which a tactless, brusque physician has scolded or otherwise occasioned resentment or feelings of guilt and inadequacy on the part of the mother. "Never show irritation at an unreasonable mother" is always a safe rule for the physician to follow.

The attitude of mind that I believe the physician should have himself and should inculcate in the mothers of his little patients is very effectively expressed by Ralph Waldo Emerson in the following passage from his Essay on Education:

> I believe that our own experience instructs us that the secret of education lies in respecting the pupil. It is not for you to choose what he shall know, what he shall do. It is chosen and foreordained, and he only holds the key to his own secret. By our tampering and thwarting and too much governing he may be hindered from his end and kept out of his own. . . . Respect the child. Be not too much his parent. Trespass not on his solitude.
>
> But I hear the outcry which replies to this suggestion: Would you verily throw up the reins of public and private discipline; would you leave the young child to the mad career of his own passions and whimsies, and call this anarchy a respect for the child's nature? I answer, Respect the child, respect him to the end, but also respect yourself. Be the companion of his thought, the friend of his friendship, the lover of his virtue and the imperturbable slighter of his trifling.

Heart Disease and Pregnancy.—No woman who has once had heart failure should risk pregnancy. No woman with auricular fibrillation or heart block or history of rheumatism or considerable cardiac enlargement with or without valvular disease should be allowed to become pregnant.—Dr. K. D. Wilkinson, Birmingham, quoted by Fisher, Alexander: Aphorisms in Clinical Medicine, *Canad. J. Med. & Surg.* **77**:166 (June) 1935.

INFECTIOUS MONONUCLEOSIS

PART I. CLINICAL ASPECTS

C. A. McKINLAY, M.D.
MINNEAPOLIS

The fact that infectious mononucleosis is reported chiefly from institutional groups suggests that its recognition in private practice is not common. This is to be expected because of the benignity of the disease and its similarity to relatively brief systemic infections which may not suggest the necessity of making supplementary leukocyte and differential blood counts. This disease entity will be commonly recognized only when its symptomatology becomes of interest to the clinician and when its characteristic lymphocytic blood reaction can be demonstrated with a fair degree of regularity.

The statements (which will be challenged) of such competent hematologists as Kracke and Garver [1] that morphologically the disease cannot be distinguished with certainty from acute lymphatic leukemia emphasize the need for a survey of recent reports.

The present paper is based on data acquired over a period of twelve years. Although it may be presumptuous to speak of a disease entity before the etiology is established, the clinical characteristics of the patients in this group have been well defined and have been adequate to make possible the recognition of most of the sporadic cases reported from a rather large service for infectious disease. Even before the notation of Paul and Bunnell [2] that the serum of each patient with this disease rather specifically showed sheep cell agglutinins, which observation strengthened the probability of its entity and became an added diagnostic test, the constancy of the clinical aspects and the blood picture in the sporadic cases reported herein had been impressive; that is, the clinical diagnosis was repeatedly confirmed by a detailed study of the morphology of the blood.

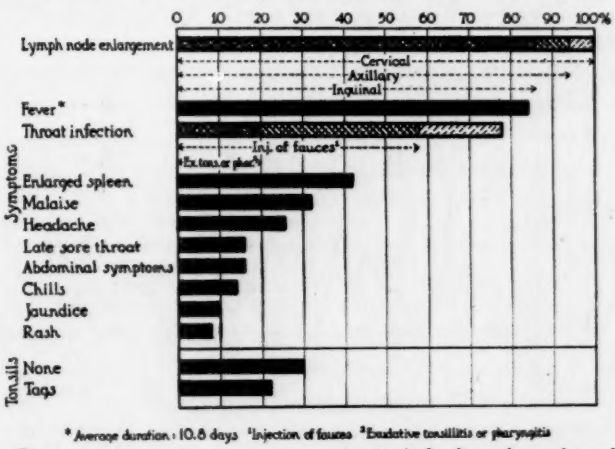

Chart 1.—Outstanding symptoms and physical signs in order of frequency in fifty cases (thirty-eight male, twelve female) of infectious mononucleosis.

The present study supplements our publication of 1923,[3] which appeared under the descriptive title of "Acute Lymphadenosis Compared with Acute Lympha-

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From the Students' Health Service, University of Minnesota.

Read before the Section on Practice of Medicine at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Kracke, R. R., and Garver, Hortense: The Differential Diagnosis of the Leukemic States, J. A. M. A. **104**: 697-702 (March 2) 1935.
2. Paul, J. R., and Bunnell, W. W.: Presence of Heterophile Antibodies in Infectious Mononucleosis, Am. J. M. Sc. **183**: 90-104 (Jan.) 1932.
3. Downey, Hal, and McKinlay, C. A.: Acute Lymphadenosis Compared with Acute Lymphatic Leukemia, Arch. Int. Med. **32**: 82-112 (July) 1923.

tic Leukemia," which, in turn, followed the report of similar cases by Sprunt and Evans,[4] Bloedorn and Houghton,[5] and Longcope[6] in 1920, 1921 and 1922, respectively. Sprunt and Evans' term "infectious mononucleosis" has been commonly used in this country. We have used their term in order to avoid the rather loose use of the term "glandular fever," which is sometimes found in the literature and which embraces such conditions as cervical adenitis.

Lehndorff and Schwarz[7] in their complete survey of the literature on glandular fever describe two main groups: (1) the Pfeiffer[8] or glandular type and (2) the anginose type. The enlargement of the lymph nodes in the former and the involvement of the throat in the latter were the predominating features. These observers considered that cases described as monocytic angina are of the anginose type. They were unacquainted with a prolonged febrile type with the maculopapular rash described by Tidy.[9]

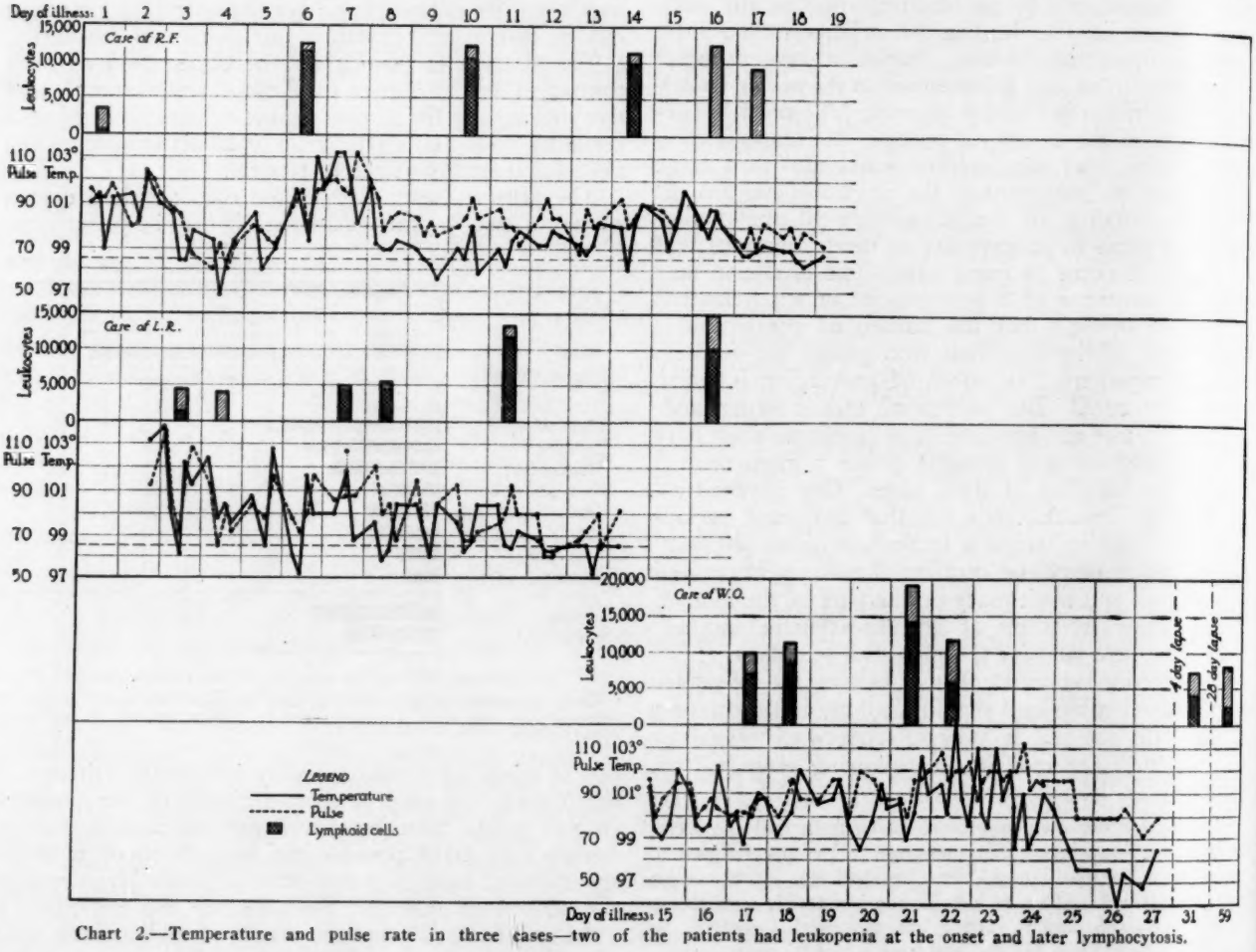

Chart 2.—Temperature and pulse rate in three cases—two of the patients had leukopenia at the onset and later lymphocytosis.

CLINICAL DATA

The present study is based on observations made in fifty cases in university students, thirty-eight males and twelve females, aged 19 to 27, with an average age of 21 years. The age and sex incidence reflects that of the student body in which the cases occurred, and the age incidence is in keeping with the general tendency toward frequency in children and young adults and toward rarity in those over 40. The onset is associated with the following conditions, those without early angina sometimes having its late appearance (chart 1):

1. Angina or infection of the upper respiratory tract, 54 per cent.
2. Systemic febrile reaction, 20 per cent.
3. Abdominal symptoms, 16 per cent.
4. Adenopathy, 10 per cent.

Generalized enlargement of the lymphatic glands was the outstanding and constant clinical feature. Occasionally it was striking enough subjectively to be the presenting symptom. The adenopathy apparently began and reached its maximum in the cervical triangles, often asymmetrically, with involvement of the left nodes more frequently predominating. The posterior cervical lymphatic chains were constantly enlarged, those in the anterior triangle of the neck being less prominent. The extent of the adenopathy was out of proportion to the intensity of the lesion in the throat and was especially striking in the absence of angina or pharyngitis. The deep cervical nodes were massed in some cases under the sternomastoid muscle about its middle and somewhat below the angle of the jaw. Otherwise, the individual nodes were discrete, somewhat soft and elastic and rarely exquisitely tender; indeed, usually there was no appreciable pain. They reached a maximum of 3 cm. in length. They lacked the periglandular redness, swelling and edema sometimes noted in cases of cervical

4. Sprunt, T. P., and Evans, F. A.: Mononuclear Leukocytosis in Reaction to Acute Infections (Infectious Mononucleosis), Bull. Johns Hopkins Hosp. **31**: 410 (Nov.) 1920.
5. Bloedorn, W. A., and Houghton, J. E.: Occurrence of Abnormal Leukocytes in the Blood in Acute Infections, Arch. Int. Med. **27**: 315 (March) 1921.
6. Longcope, W. T.: Infectious Mononucleosis (Glandular Fever), with Report of Ten Cases, Am. J. M. Sc. **164**: 781-808 (Dec.) 1922.
7. Lehndorff, H., and Schwarz, E.: Das Drüsenfieber, Ergebn. d. inn. Med. u. Kinderh. **42**: 775-888, 1932.
8. Pfeiffer, E.: Das Drüsenfieber, Jahrb. f. Kinderh. **29**: 257-264, 1889.
9. Tidy, H. L.: Glandular Fever and Infectious Mononucleosis, Lancet **2**: 180-186 (July 28) 1934.

adenitis subsequent to oral infection and scarlet fever. Suppuration did not occur and has rarely been reported. The posterior auricular nodes were not usually enlarged —in contrast to the adenopathy noted in cases of rubeola. The axillary and inguinal nodes were rather constantly enlarged and were distinguishable from the smaller firmer nodes of the occasional axillary and frequent inguinal adenopathy which occurs in healthy persons. The epitrochlear nodes were frequently palpable. Enlargement of the hilum and abdominal nodes was not demonstrated in our series.

Signs of throat infection were present in 78 per cent of cases. 1. Most frequently there was marked injection of the fauces with swelling of the lymphoid tissue, the so-called granular pharyngitis. 2. Less commonly, a membranous angina indistinguishable in appearance from that of diphtheria developed. 3. Occasionally, follicular tonsillitis or pharyngitis existed. The faucial changes appeared late in about one third of the cases with an onset characterized by the other predominating systemic abdominal or glandular symptoms. The spleen was palpable in 42 per cent of cases; its margin soft and its size never great. One instance of maculo-

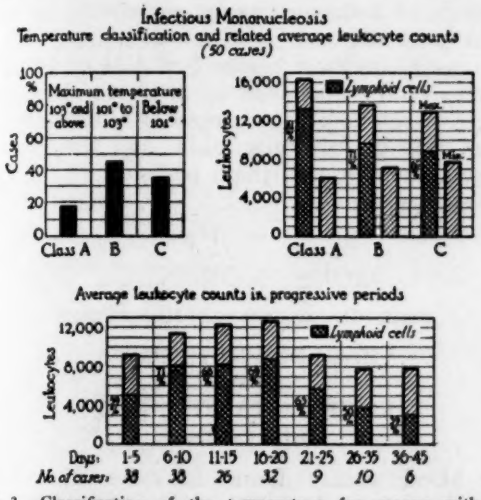

Chart 3.—Classification of the temperature for groups with related leukocyte and differential counts; also average counts grouped according to days after the onset.

papular rash was noted. Three other cases were classified as toxic rashes simulating dermatitis due to some drug. No complications occurred and complete recovery resulted in all cases as far as known, although enlargement of the lymphatic glands sometimes persisted for twelve months after the onset of the infection. Recrudescence of symptoms was noted occasionally (chart 2).

The infectious features varied but fever was almost always present with malaise, headache, sweating and chills, listed in the order of frequency. Prostration was not so marked as in cases of acute tonsillitis. The temperature reached a maximum of 103.8 F., usually not reaching 103. It was irregular and showed wave-like recrudescences in the more prolonged cases and lasted up to three weeks in the patients with higher temperatures and for four months in one subacute case in which there were minimal temperatures. The pulse rate, which was relatively slow, varied directly with the temperature. Defervescence was by lysis, contrasting with the fall by crisis not uncommonly encountered in cases of tonsillitis. Jaundice occurred in five cases; in three, combined with gastro-intestinal symptoms, it subsided with defervescence. An infectious origin of jaundice is suggested, although Mackey and Wakefield[10] reported a case of obstructive jaundice which they thought was due to obstruction of the common duct by lymph nodes (charts 3 and 4).

The total leukocyte and differential blood counts were striking and emphasized the fact that differential counts must be made. Lymphocytosis, relative and absolute, was 50 per cent or greater in all cases at some time during the course of the disease. The initial

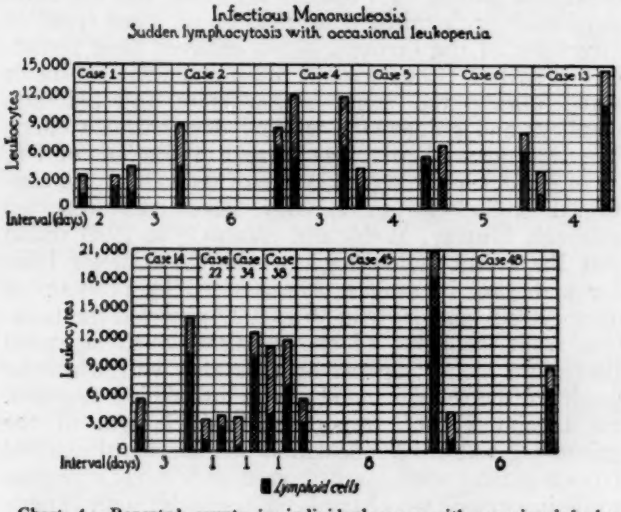

Chart 4.—Repeated counts in individual cases with occasional leukopenia or neutrophilic leukocytosis followed by sudden lymphocytosis.

leukocyte count was 5,000 or less in eleven of fifty cases and reached a minimum of 3,300 in one case, and in four of the eleven never reached a level of 10,000 or over. The maximum count was 32,550. Leukocytosis of 10,000 or over occurred at some time in forty of the fifty cases. The percentage of granulocytes noted in initial counts was known to drop as much as 63 per cent as the leukopenia gave way to moderate leukocy-

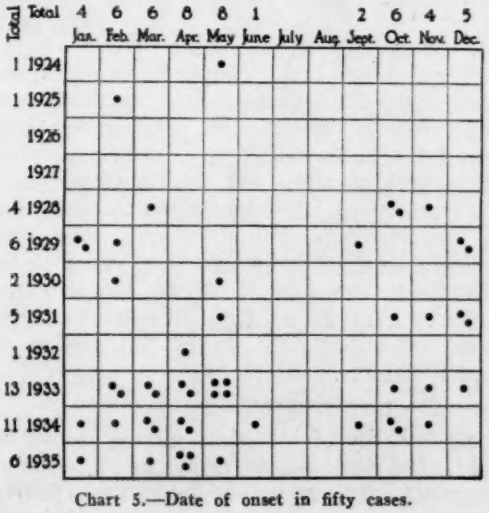

Chart 5.—Date of onset in fifty cases.

tosis. Lymphocytosis appeared to be greater in the patients with higher temperatures. There were numerous records of patients who had had other infections before and after glandular fever with the usual polymorphonuclear response. These records indicate that the lymphatic reaction to glandular fever is not on a constitutional basis but is a response to a definite type of infection.

10. Mackey, R. D., and Wakefield, E. G.: Occurrence of Abnormal Leukocytes in Blood of Patient with Jaundice (Infectious Mononucleosis—Glandular Fever), Ann. Clin. Med. 4: 727-730 (March) 1926.

The urinalyses were not remarkable; hematuria, which has been noted by some authors, did not occur. A critical study of the hemoglobin and the red blood counts was not made, although the impression of the absence of appreciable anemia was obtained.

The study of the etiology included the making of direct smears and occasional cultures from the throat, but no characteristic observations were made. The occasional finding of Vincent's organism was not more significant or frequent than in cases of other types of infections of the throat. Blood cultures were repeatedly negative. Emulsions of fresh glandular substance made during the acute stages were injected into monkeys and guinea-pigs without demonstrable effect. The Forssman reaction was present in dilutions of 1 to 32 or greater in the serum in five of ten cases. No confirmed studies as to etiology have been reported although Murray, Webb and Swann [11] in 1926 found that Bacterium monocytogenes was the etiologic basis for a disease in rabbits characterized by pronounced monocytosis, and Nyfeldt [12] in 1929 reported the isolation from the blood of an organism which he called Bacterium monocytogenes-hominis and with which he produced the cellular blood picture in rabbits. Gorham, Smith and Hunt [13] reported blood changes in the guinea-pig following inoculation of pharyngeal exudate from a patient with a severe case of Vincent's angina, while in persons who have been in contact with experimental animals infectious mononucleosis has developed. However, this work has not been confirmed. The sheep cell agglutination reaction recently has been studied critically by Bailey and Raffel.[14] They confirmed its apparent constancy in the disease and emphasized its importance, but stated that a heterophil or Forssman antibody is not responsible for the reaction; that the antibodies are not found in normal serum but are rather a specific response associated only with infectious mononucleosis. The symptomatology suggests that the gastro-intestinal tract, in addition to the upper respiratory tract, must be considered as a possible portal of entry of the etiologic agent (chart 5).

While glandular fever characteristically occurs in epidemics, our series consisted of sporadic cases of fairly even monthly distribution. The incubation period was given by Lehndorff and Schwarz as seven or eight days, with usually short prodromal periods. The degree of infectivity must be low as we have not seen proved contact cases, although four cases occurred in laboratory workers in bacteriology, two coincidently. Two brothers living together had the disease four years apart. Four of eight patients in whom the disease occurred within two months had similar gastro-intestinal symptoms.

DIFFERENTIAL DIAGNOSIS

If the possibility of infectious mononucleosis is kept in mind by the clinician, the errors of omission will be less frequent, and there will be fewer cases left in that residium of acute systemic infections sometimes unclassified or covered with a general term such as influenza. The most common confusion arises from tonsillitis and pharyngitis of other origin with secondary cervical adenitis. In our first encounter with infectious mononucleosis in 1921, a case was clinically confused with acute lymphatic leukemia because of the additional feature of hemorrhagic areas in the buccal mucosa; only five other similar cases have been reported according to Tidy.[9] The persistent, often localized adenopathy of Hodgkin's disease and tuberculous adenitis were not suggested in any instance; syphilis has not existed clinically or serologically in this group. The cases in which there were abdominal symptoms might well be confused with acute gastro-enteritis or appendicitis, but the absence of signs of peritoneal irritation with its concomitant adenopathy and blood picture has been adequate to differentiate this condition. We have not noted cases of involvement of the central nervous system as reported by Johansen [15] and by Epstein and Dameshek.[16]

SUMMARY

The characteristic generalized adenopathy, frequent splenomegaly and lymphatic reaction of the blood make possible the recognition of sporadic cases of infectious mononucleosis occurring among a large group of patients with various acute infections. Angina may be late in appearance or entirely absent. The occasional appearance of abdominal symptoms should be kept in mind in order to avoid confusion with acute infections of the gastro-intestinal tract. Serial blood counts are not infrequently necessary in order to discover the lymphocytic reaction. The constancy of the adenopathy suggests that the essential lesion and habitat of the etiologic agent is in the lymph nodes.

78 South Ninth Street.

INFECTIOUS MONONUCLEOSIS

PART II. HEMATOLOGIC STUDIES

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AND
JOSEPH STASNEY, M.D.
MINNEAPOLIS

The blood picture found in cases of infectious mononucleosis was described in detail by Downey and McKinlay [1] in 1923. Their paper was accompanied by a colored plate illustrating the different types of lymphocytes seen in the blood smears of the patients studied up to that time. The reproduction of the original drawings was unusually good, and a photograph of this plate is reproduced in figure 1.

The lymphocytosis which follows the initial neutrophilic leukocytosis is usually characterized by the presence of very atypical leukocytoid lymphocytes, like those shown in cells 1 to 11 in figure 1. The lines in this illustration separate the cells found in the blood of three different patients with infectious mononucleosis and one patient with acute lymphatic leukemia (cells 12 to 14) that was added for comparison. There is considerable variation in the character of the atypical lymphocytes in different patients and for that reason it was stated that the patients can be divided roughly into three groups depending on the type of lymphocyte

11. Murray, E. G. D.; Webb, R. A. A., and Swann, M. B. R.: Disease of Rabbits Characterized by Large Mononuclear Leukocytosis, Caused by Hitherto Undescribed Bacillus, Bacterium Monocytogenes (N. Sp.), J. Path. & Bact. **29**: 407-439 (Oct.) 1926.
12. Nyfeldt, A.: Etiologie de la mononucleose infectieuse, Compt. rend. Soc. de biol. **101**: 590-592 (June 21) 1929.
13. Gorham, L. W.; Smith, D. T., and Hunt, H. D.: The Experimental Reproduction of the Blood Picture of Infectious Mononucleosis in the Guinea-Pig, J. Clin. Investigation **7**: 504-505 (Aug.) 1929.
14. Bailey, G. H., and Raffel, S.: Hemolytic Antibodies for Sheep and Ox Erythrocytes in Infectious Mononucleosis, J. Clin. Investigation **14**: 228-244 (March) 1935.
15. Johansen, A. H.: Serous Meningitis and Infectious Mononucleosis, Acta med. Scandinav. **76**: 269-272, 1931.
16. Epstein, S. H., and Dameshek, William: Involvement of Central Nervous System in Case of Glandular Fever, New England J. Med. **205**: 1238-1241 (Dec. 24) 1931.

From the Department of Anatomy, University of Minnesota Medical School.
Read before the Section on Practice of Medicine at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Downey, Hal, and McKinlay, C. A.: Acute Lymphadenosis Compared with Acute Lymphatic Leukemia, Arch. Int. Med. **32**: 82 (July) 1923.

which dominates the blood picture. These cells were described in the previous paper.

A continued study of the blood in this disease has shown that little can be added to the original description of the blood picture.[1] We have encountered an occasional patient in whom the lymphocytes were of fairly normal structure; usually they are the large atypical basophilic lymphocytes which show a tendency

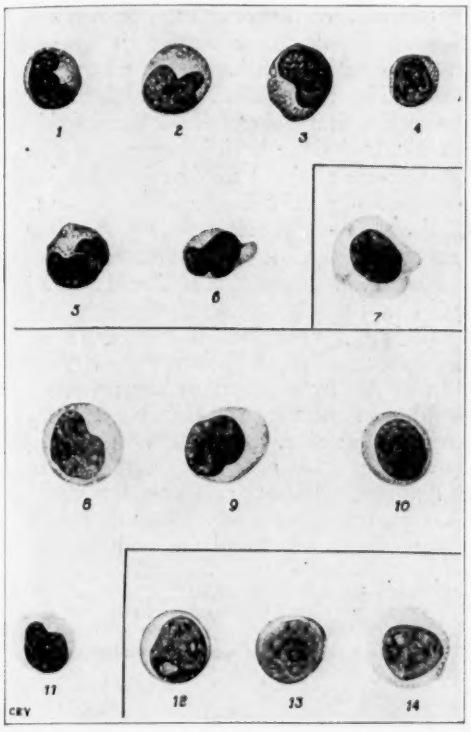

Fig. 1.—Cells 1 to 11 are lymphocytes from blood smears made in three cases of infectious mononucleosis. Cells 8 and 9 have immature nuclei. Cell 11 contains an Auer body. Cells 12 to 14 are immature lymphocytes from a patient with acute lymphatic leukemia.

to develop toward plasma cells. A few plasma cells are often found and in Angelini's [2] patient they were numerous, but generally the cells fail to complete their development into plasma cells.

The abnormal morphology of the lymphocytes shows that the condition is not an ordinary lymphocytosis like that seen in cases of pertussis, which is characterized by a great increase in the number of lymphocytes of normal structure, except in very young children, in whom many of them may be immature. The term "lymphatic reaction" as used by Türk,[3] Schwarz [4] and others is a better designation of the lymphocytic picture seen in cases of infectious mononucleosis.

Confusion has resulted from the fact that many investigators of this disease have believed that the large basophilic lymphocytes are immature lymphoblasts similar to those seen in cases of acute lymphatic leukemia. Further study in many cases, however, has shown that the cells are usually not immature and that the blood picture does not suggest that seen in cases of acute leukemia. The confusion is due to the fact that the criteria for judging the degree of immaturity of lymphocytes have not always been understood. This explains the recent conclusion of Stuart, Burgess, Lawson and Wellman,[5] who followed Wiseman [6] in expressing the belief that the basophilic lymphocytes are immature. Hematologists (Pappenheim, Ferrata, Naegeli) have agreed that basophilia of cytoplasm is extremely variable in lymphocytes; the young cells may or may not be very basophilic, while plasma cells, which are mature cells, are very basophilic. Genuine lymphoblasts, as seen in cases of acute lymphatic leukemia, have an extremely delicate leptochromatic nuclear pattern which is very different from that of the mature lymphocytes of normal blood. Three immature lymphocytes are shown in cells 12 to 14 of figure 1. In cases of infectious mononucleosis the nuclear pattern is often even coarser than it is in normal lymphocytes, owing to the tendency of these cells to develop into plasma cells. Lymphoblasts approach the structure of myeloblasts, and the nuclear structures may be identical if the cells are sufficiently immature. Lymphoblasts of this type are not often seen in cases of infectious mononucleosis.

In our first series of nine cases there was one case in which a few of the lymphocytes were both immature and "leukocytoid." These are shown in figure 1, cells 8 and 9. The cytoplasm of these cells is not as basophilic as that of cells 1 to 6 but the nuclear pattern shows the delicate, leptochromatic structure that characterizes immature nuclei. An occasional cell of this type contained an Auer body, and some had nucleoli.

Therefore, a few immature lymphocytes are found in some cases of infectious mononucleosis. The two

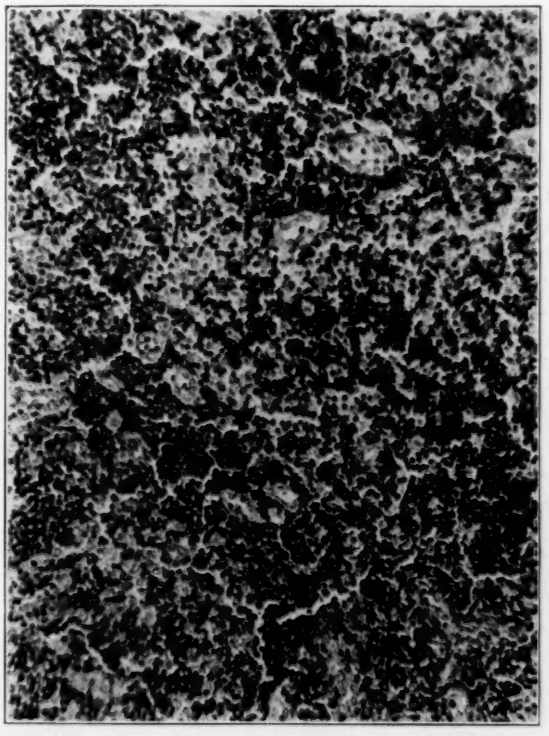

Fig. 2.—Section of a lymph node removed for biopsy from a patient with infectious mononucleosis. This low power view shows the nodular hyperplasia of the reticulum and the obliteration of the architecture of the node.

cells illustrated (cells 8 and 9) are the youngest found in our earlier and later series. They are not sufficiently immature to be called stem cells or lymphoblasts. That

2. Angelini, G.: Osservazione di febbre ghiandolare, Haematologica **15**: 781, 1934.
3. Türk, W.: Septische Erkrankungen bei Verkümmerung des Granulozytensystems, Wien. klin. Wchnschr. **20**: 157, 1907; Vorlesungen über klinische Haematologie, Vienna, Wilhelm Braumüller, 1912.
4. Schwarz, E.: Hämatologie des Drüsenfiebers, Ergebn. d. inn. Med. u. Kinderh. **43**: 1, 1932.
5. Stuart, C. A.; Burgess, A. M.; Lawson, H. A., and Wellman, H. E.: Some Cytologic and Serologic Aspects of Infectious Mononucleosis, Arch. Int. Med. **54**: 199 (Aug.) 1934.
6. Wiseman, B. K.: Criteria of the Age of Lymphocytes in the Peripheral Blood, J. Exper. Med. **54**: 271 (Aug.) 1931; The Identity of the Lymphocyte, Folia haemat. **46**: 346, 1932.

the latter may occur in this disease is proved by the beautiful and accurate colored figures published by Schwarz,[4] and the descriptions of Glanzmann[7] and Nyfeldt[8] among others. These authors have stated that the immature cells are of infrequent occurrence and that they are never numerous. Mitosis and amitosis of lymphocytes has been described by several authors but was never seen in our series.

Fig. 3.—Same as figure 2, but with higher power.

We have frequently found lymphocytes that were slightly immature but never sufficiently so to cause difficulties in differentiating the case from one of early acute lymphatic leukemia. Schwarz[4] expressed the belief that some cases in which there are a few very immature lymphocytes in the blood might be mistaken for cases of early leukemia. We believe, however, that the "leukocytoid" character of the lymphocytes is sufficiently specific to enable one to distinguish between the benign and leukemic forms. The presence of toxic neutrophils and the shift to the left in the Schilling sense are other features which enable one to decide in favor of the benign condition.

This blood picture is not absolutely specific for infectious mononucleosis. We have seen one case in which the blood picture of infectious mononucleosis and total leukocyte count of about 15,000 changed to fatal agranulocytosis with a total count of 800. In another case of agranulocytosis, all the granulocytes were lost from the blood for a period of three days. The total count of leukocytes composed of leukocytoid lymphocytes and a few monocytes did not fall below 1,400 and the patient recovered. A similar lymphatic reaction has been seen also in a case of septicemia. Such confusing cases are fortunately very infrequent. Hematologically (without the history), they may be mistaken for cases of infectious mononucleosis but never for cases of acute leukemia.

7. Glanzmann, E.: Das lymphaemoide Drüsenfieber, Abhandlungen a. d. Kinderh. u. ihren Grenzgebieten, No. 25, Beihefte z. Jahrb. f. Kinderh., 1930.

8. Nyfeldt, A.: Klinische und experimentelle Untersuchungen über die Mononucleosis infectiosa, Folia haemat. **47**: 1, 1932.

Examination of biopsy material from the lymph nodes in eight cases suggested an explanation for the occurrence of immature lymphocytes in the blood smears in some cases (fig. 1, cells 8 and 9). These immature cells may be as atypical as the mature ones, the immaturity being indicated by the delicate leptochromatic nuclear structure and the presence of nucleoli.

The patients from whom the nodes were removed showed different degrees of severity of the disease and the biopsies were performed at varying periods after the onset of the disease. This undoubtedly explains the variations in the degree of pathologic alteration noted. The material was studied in sections and also by the dry imprint method, the May-Grünwald-Giemsa stain being used. The cytologic detail of the imprints is about as good as that of the blood smears, which makes this a very useful method for tracing the orgin of the atypical lymphocytes of the blood.

The architecture of the nodes showing the greatest alteration is completely obliterated and there is marked hyperplasia of both lymphocytes and reticulum. This hyperplasia is not uniform. Dense areas of lymphocytes alternate with areas in which the lymphocytes are scattered and the hyperplasia of the reticulum is more pronounced. In the denser areas the lymphocytes are fairly uniform in size, and a section through such a region gives a picture much like that seen in cases of chronic lymphatic leukemia. The lymphocytes show great variation in size and structure in the regions where they are scattered and where hyperplasia of the reticulum is more pronounced. This hyperplasia involves groups of reticular cells which swell and become rounded and probably proliferate. This gives the sections the nodular or spotty appearance described by Pratt[9] for this disease and by Nishii[10] for the

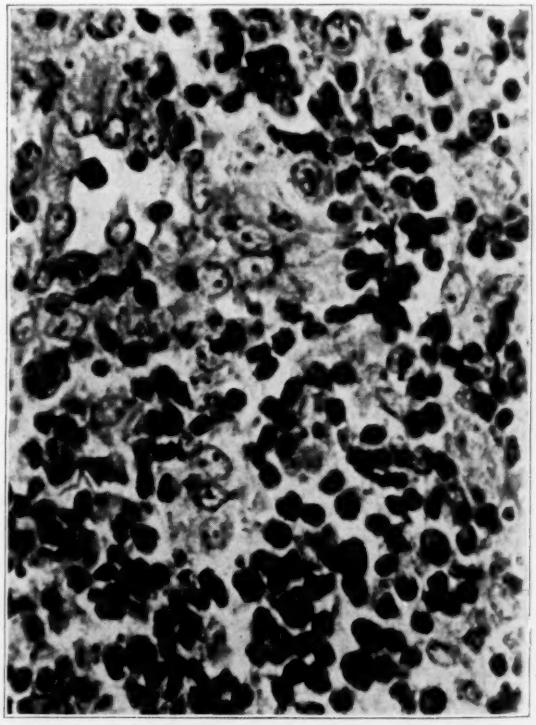

Fig. 4.—Same as figures 2 and 3; high power. The rounding up of the reticular cells is shown in the central portion of the section.

9. Pratt, C. L. G.: The Pathology of Glandular Fever, Lancet **2**: 794 (Oct. 10) 1931.

10. Nishii, R.: Ueber die Reaktion der regionären Lymphknoten bei lokaler Infektion und Reinfektion, Krankheitsforschung **7**: 333 (Oct.) 1929.

regional lymph nodes of guinea-pigs after subcutaneous reinfections with Staphylococcus pyogenes-aureus of weak virulence. This is illustrated in figures 2, 3 and 4, which are different magnifications of the same specimen of lymph node. In figure 4 these nodules of reticular cells often crowd out the lymphocytes.

One other node of the series showed about the same structure as that just described, and the others showed varying degrees of the same process. In one the sinuses were well preserved but filled with reticulo-endothelial cells; there were also remnants of follicles and germ centers. Nodules of reticular cells were seen in the looser tissue between the follicles and in the medulla. This node was removed two weeks after the onset of the illness. The leukocyte count did not rise above 13,200, with 79 per cent lymphocytes. A node from another patient in the series was normal for the most part and hyperplastic in one region. The other nodes were decidedly hyperplastic but to a varying degree. They all showed the nodular hyperplasia of the reticulum.

Even in the sections it is obvious that some cells isolate themselves from the nodules of hyperplastic reticulum and transform into lymphocytes. This is seen in the central portion of figure 4, where several cells have acquired narrow rims of basophilic cytoplasm and are isolating themselves from the main mass of reticulum.

The details of the differentiation of these cells into lymphocytes are seen best in the imprints, and several stages of the process are illustrated in figure 5. Cell 1 is a cell of the reticulum with a nucleus showing the specific structure that is characteristic for these cells. The delicate strands and fine granules of chromatin are very distinct and there is sharp separation between chromatin and parachromatin. In cell 3 the strands of chromatin have become much heavier and the nuclear pattern has approached that of the lymphocyte. The cytoplasm is just beginning to condense and acquire the basophilia of lymphocytic cytoplasm. In cell 2 the nucleus is still that of the reticular cell but the cytoplasm has become rounded and condensed and is distinctly basophilic. Cell 5 is a normal mature large lymphocyte, and cells 6 and 7 are undergoing metamorphosis into plasma cells, of which there are many in this material.

Intermediate stages similar to those illustrated are very numerous in material taken at the height of the disease, so one must conclude with Schwarz [4] that there has been a marked shift to the left in lymphocyte regeneration to the extent that the reticulum becomes extensively involved in the process. There is some development of lymphocytes from reticulum in normal nodes (Downey and Weidenreich,[11] Mollier,[12] Jolly,[13] Maximow [14]) but the process is not as active as in cases of infectious mononucleosis.

Many of the large basophilic and leukocytoid lymphocytes seen in the blood smears are also found in the imprint preparations of material from the nodes and there is good correlation between the character of the lymphocytes of the imprints and the lymphocytes of the blood smears from the same patient. From this it seems obvious that many of the atypical lymphocytes of the blood have assumed their abnormal features while still in the nodes. The correlation between the degree of hyperplasia of the nodes and the total leukocyte count is not so good.

There seems to be no relation between the basophilia of the cytoplasm and the degree of maturity of the lymphocytes. Any lymphocyte, large or small, mature or immature (as judged by nuclear structure), may become very basophilic, indicating that basophilia is not a good criterion for estimating the immaturity of a lymphocyte, as claimed by Wiseman.[6]

Some of the maturing and metamorphosing (Schwarz [4]) lymphocytes may escape into the blood before they have completed their development. This was evident when we compared blood smears with imprints made in the same cases. Lymphoblasts as seen in cases of acute lymphatic leukemia (fig. 1, cells 12 and 13) are rarely seen in the blood smears. Only one lymphoblast of this type was found in our imprint material and is illustrated in cell 4 of figure 5. The few immature blood lymphocytes of infectious mononucleosis are more likely to be cells that show some

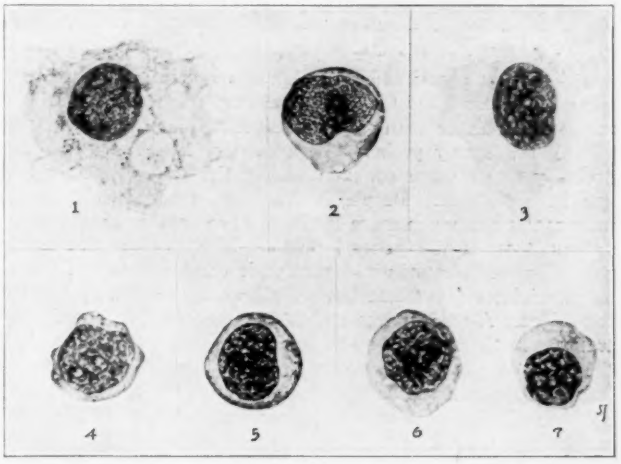

Fig 5.—Drawings of cells from dry imprint preparations made from lymph nodes removed from infectious mononucleosis. Cell 1 is an undifferentiated reticular cell showing details of the nuclear structure. Cell 2 is an immature lymphocyte which has been derived from the reticulum. Its nuclear structure is still much like that of a reticular cell. Cell 3 is a reticular cell in which the nucleus has differentiated and acquired some lymphocytic characters. Cell 4 is an immature lymphocyte (lymphoblast) with two nucleoli. This type of lymphocyte is common in cases of lymphatic leukemia but is rare in cases of infectious mononucleosis. Cell 5 is a basophilic, mature, large lymphocyte. Cells 6 and 7 are lymphocytes that are developing into plasma cells.

reticulo-endothelial characters in their nuclei. Most of them would have a nuclear pattern that is intermediate between cells 2 and 5 of figure 5. There is, therefore, a difference between even the very immature lymphocytes of the disease under consideration and the lymphoblasts in cases of acute lymphatic leukemia. Downey [15] has shown that in the latter disease the regeneration of lymphocytes differs from the normal process. In infectious mononucleosis it proceeds according to the normal scheme, except that the development from the reticulum is accentuated and many of the cells become atypical.

CONCLUSIONS

Examination of the biopsy material from the lymph nodes of patients with infectious mononucleosis shows that the hyperplasia of lymphocytes is not as extensive or as uniform as in cases of lymphatic leukemia. The

11. Downey, Hal, and Weidenreich, F.: Ueber die Bildung der Lymphozyten in Lymphdrüsen und Milz, Arch. f. mikr. Anat. **80:** 306, 1912.
12. Mollier, S.: Die lymphoepithelialen Organe, Sitzungsber. d. Ges. f. Morphol. u. Physiol. München **29:** 14, 1913.
13. Jolly, J.: Traité technique d'hématologie, Paris, A. Maloine et fils, 1923.
14. Maximow, Alexander: Bindegewebe und blutbildende Gewebe, in von Möllendorff, Wilhelm: Handbuch der mikroskopischen Anatomie des Menschen, Berlin, Julius Springer, 1927, vol. 2, pt. 1, p. 359; Lymphocytes and Plasma Cells, in Cowdry, E. V.: Special Cytology, New York, Paul B. Hoeber, 1932, vol. 2, p. 603.
15. Downey, Hal: The Occurrence and Significance of the "Myeloblast" Under Normal and Pathologic Conditions, Arch. Int. Med. **33:** 301 (March) 1924; The Myeloblast—Its Occurrence Under Normal and Pathological Conditions, and Its Relations to Lymphocytes and Other Blood Cells, Folia haemat. **34:** 65 (June), 145 (Aug.) 1927.

hyperplasia of the reticulum is due to swelling and proliferation of groups of reticular cells, giving sections a spotty and nodular appearance identical with that described by Nishii after staphylococcic reinfections.

The changes in the nodes, together with the atypical structure of the lymphocytes and the increase in their number, indicate that the disease is due to infection with some organism or virus which has a very specific stimulating effect on the lymphocytes and reticulum and a depressing effect on the granulocytic system.

The blood picture is very characteristic but not absolutely specific, as there are some other types of infection which occasionally show the same blood picture.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. MC KINLAY AND DRS. DOWNEY AND STASNEY

DR. A. H. GORDON, Montreal: There are a few thoughts that occur to one. The first is the natural fear of leukemia when this symptom complex comes to the fore, and to an experienced hematologist this fear probably becomes less and less. But I doubt whether there is any one who, on seeing a case of this sort, has not had a day or more of qualms lest the greater thing might be present when only the lesser appeared. The next thing that strikes one is the presence of this disease in people of early adult life and in my own experience it has been almost altogether among people connected with medical schools or with nursing schools. This fact would suggest that this may probably be a carrier disease and that it is probably much more common among the general public than has been thought. People in hospitals, medical schools and universities are much more likely to have routine blood examinations than is the general public. The final matter is the possibility of infectious mononucleosis occurring with little or no glandular enlargement but with predominant enlargement of the spleen. A student nurse of 21 left the hospital to undertake training in the maternity pavilion on the 14th of April and on the 17th complained of an infection of the upper respiratory tract. On the 21st she returned to the hospital with a temperature of 102, quite acutely ill, with an infection of the upper respiratory tract and a predominantly sore throat. She had no glandular enlargement, but she had a very definite enlargement of the spleen. May 9 the temperature was normal, no glandular enlargement had been noted except a week after onset, and following daily examinations of her glands two small split-pea-sized glands had been found in the epitrochlear areas. At the end of her illness, three weeks later, this girl had shown all the typical features of infectious mononucleosis with leukocyte counts running about 10,000, with an average lymphocyte count of 80 per cent, and polymorphonuclears of 20 per cent, the platelets ranging between 175,000 and 200,000. Otherwise there was a normal blood count and at the end of the time she still had an enlarged spleen and the almost imperceptible lymphatic glands. The following January her blood count still showed 58 per cent of polymorphonuclears and the remainder of lymphocytes. The points that would occur to me as of importance are the great possibility of error as between this and lymphatic leukemia, its presence in young adults (especially in institutions), and the possibility that the disease may show itself as a splenic hypertrophy and not as a predominantly lymphatic glandular hypertrophy.

DR. ISRAEL DAVIDSOHN, Chicago: I will limit my remarks to a discussion of the serologic nature of the so-called heterophilic antibodies in infectious mononucleosis. I found a markedly elevated titer of these antibodies in horse serum disease and my results were published in 1929. Paul and Bunnell observed, while checking my work in serum disease, that cases of infectious mononucleosis showed a similar rise of the antibodies. Since their publication in 1932, a large number of reports have confirmed their observations. The name "heterophilic antibodies" indicates that the blood of the sheep has no part in their production. Such antibodies are present in the serum of most normal persons and by means of proper absorptions it was shown that they belong to a special group of heterophilic antibodies, the so-called Forssman group. To belong to that group the antibodies must react with the tissues of the guinea-pig. I have shown that the heterophilic antibodies in horse serum disease belong to the Forssman group. In many recent reports, the antibodies in infectious mononucleosis were referred to without justification as Forssman antibodies. When the serum of normal persons is treated with suspensions of the kidney of the guinea-pig, the agglutinins for sheep red cells are readily and thoroughly removed. When the serum from a patient with serum disease is similarly treated, the results are about the same. However, when the serum of patients with infectious mononucleosis is subjected to such treatment, the kidney of the guinea-pig fails to remove completely the agglutinins against sheep cells, but its effect is that of a nonspecific absorption. The absorption permits a serologic differentiation of infectious mononucleosis from serum disease. There are not infrequently patients with clinical and hematologic signs suggesting infectious mononucleosis in whom the titers of heterophilic antibodies are in the so-called borderline group according to my technic. By means of the absorption test it is easy to separate such cases from true serologic infectious mononucleosis. It may become necessary to divide infectious mononucleosis into two groups—a seropositive and a seronegative.

DR. C. A. MCKINLAY, Minneapolis: Dr. Gordon's experience in which splenomegaly was a predominating feature is new to us. With regard to the agglutination tests our experience is limited to eleven cases, in six of which it was positive in significant titers. An occasional diffuse erythematous rash similar to a toxic drug rash has been observed. Tidy described a rash similar to typhoid in epidemics in England. We feel that if the clinical picture of this disease is emphasized and if the hematologic changes as described by Dr. Downey are recognized, general interest will be enhanced and the study of the etiology advanced; for who could deny the importance of the study of the etiology of this disease, which is so close in certain rare features to acute lymphatic leukemia?

XANTHIC LESIONS

REPORT OF FOUR CASES, INCLUDING TWO OF "XANTHOMATOSIS" OF THE KIDNEY

M. M. MELICOW, M.D.
NEW YORK

The finding of an orange-yellow nodule in a tissue or organ is usually of arresting interest. Orange plaques on eyelids are a common and striking occurrence, and similar skin tuberosities are occasionally seen on the knees, elbows and hands; golden-brown nodules sometimes develop about tendon sheaths and joints; rarely a sinus tract discharges an amazing orange pus and leads to a similarly colored granuloma; the dull yellow of a hypernephroma sometimes displays a distinctive reddish-brown nodule, and a carcinoma of the prostate is discolored very infrequently by a similar process. Finally, there very rarely occur generalized golden-yellow infiltrations as the most striking effect of an unusual constitutional deficiency. To this miscellaneous group of clinical and anatomic conditions the term "xanthoma," introduced by Lebert in 1845 and again by W. F. Smith in 1869, to denote a yellow fibrous tumor, has been rather indiscriminately applied. The common denominator in all has been the color. Considerable confusion has resulted, because both the accumulations and the discolorations are often secondary or accidental to more significant pathologic processes, which may be inflammatory, traumatic, degenerative, deficiency or neoplastic. Furthermore, a number of different intracellular or extracellular substances can induce a similar color effect. The term

From the Squier Urological Clinic, Columbia University College of Physicians and Surgeons.

has been applied in the absence of the characteristic yellow because of the presence of the typical foam cells. Thus at the outset it is obvious that xanthoma as a general term is inadequate and that the prefix "xanthic," preceding that term which accurately characterizes the underlying condition is more logical in most instances.

THE PIGMENT

The egg-yolk color of a xanthic mass has been variously attributed to intracellular lipochrome pigments, hemoglobinogenic pigments, or both. Extracellular hemosiderin, old blood clot, or even melanin may simulate it. Bloodgood,[1] Reid and Garrett [2] state that in xanthoma the discoloration is obtained from destroyed blood. They refer to the connective tissue tumors associated with tendons and joints. Geschickter and Copeland,[3] in discussing these tumors, which they believe arise from sesamoid bones, state that the color is due to either lipoid or blood pigment. Siemens has shown that the yellow coloration of xanthomas associated with a disturbed lipoid metabolism is derived from the lipochrome pigments carotene and xanthophyll. Miller [4] points out that it is through the combination of these pigments with the otherwise colorless cholesterol esters that the color characteristic of xanthomas result.

D. T. Smith [5] distinguishes two groups of xanthic entities: (1) those in which the color is due to lipoid pigments contained in the lipoid substances of their foam cells and in which blood pigments are absent, and (2) those in which the color is due largely to the intracellular blood pigments in which foam cells are inconspicuous. Pick,[6] however, contends that with lipoid storage of every sort there is a tendency to simultaneous storage of hemoglobinogenic pigments and, furthermore, that with every added stimulation of the reticulo-endothelial system there occurs an increased hemosiderosis; that is, an increased blood destruction. I have noted the presence of fresh and old blood in xanthic masses that are associated with degenerations within neoplasms. Smith admits also that in the second group additional coloring is derived in some cases from the lipoid substances within the rare foam cells. Thus it would seem that the distinction between the two groups is one of degree; in one the pigment is mainly lipochromogenic and in the other it is largely hemochromogenic.

The xanthic masses of Smith's first group result, in some instances, from lipophagic activity following inflammatory or degenerative processes, and in others they constitute infiltration structures due to a disturbed lipoid metabolism. The orange-yellow spottings seen about old pus pockets, along sinus tracts and in broken down neoplasms, and the "pseudoxanthomas" of some authors are examples of xanthic granulomas. Xanthoma palpebrarum and xanthoma multiplex are probably degenerative phenomena, for which the terms xanthic granuloma palpebrarum and xanthic granuloma multiplex would seem more suited. The deposition of cholesterin-containing xanthic masses about elbows, hands and knees, associated with a hypercholesteremia, as in some cases of diabetes (xanthoma diabeticorum), chronic liver disease and so on are like tophi in gout.[6] Here the added factor of local irritation induces an apparently selective reaction and infiltration. The constitutional xanthomatoses, described by Pick and others, are expressions of a general dyslipoidism with marked, often diffuse, xanthic infiltrations. Occasionally, Smith notes, the cells of a neoplasm become infiltrated with cholesterin as a consequence of a local disturbance, without there being any degeneration. The mother cells of these neoplastic cells physiologically contain cholesterin fat. The xanthocarcinoma of the prostate, xanthic tumors of the adrenal and "xanthome en tumeur" of the skin and mucous membranes are instances of this development.

In the second group, the blood pigment containing group, Smith identifies true neoplasms. They occur as encapsulated and lobulated benign connective tissue tumors, associated with tendon sheaths or about joints. They are composed mainly of spindle or round cells, some giant cells and foam cells, and a brown pigment, hemosiderin. The term xanthoma is reserved by many authors for this type of deep orange mass (some call it solitary xanthomatous giant cell tumor). However, it is a question whether they are true tumors of connective tissue origin with incidental admixture of xanthoma cells and secondary hemochromophagia (xanthic fibroma or xanthic endothelioma or xanthic histioma), or whether they are granulomas following trauma of the tissues (xanthic granulomas).

The atheromatous plaques of arteries are identical in color with xanthoma.[7] Here the yellow is seen through a layer of pearly white endarteritis. When the intimal covering is incised, a grumous, slimy, yellowish material may be squeezed out, and there is a tendency to calcification with advancing years. However, microscopically, the lesion is similar to xanthoma through the presence of typical foam cells containing cholesterol esters, fatty acids and neutral fat. They represent the reticulo-endothelial response to a local excess of lipoids, and the latter may arise from the trauma resulting from the constant pounding associated with the concomitant hypertension and cardiac hypertrophy. Atheroma may also be experimentally produced by feeding animals with a diet high in cholesterol.

There are a number of lesions which resemble in color the so-called xanthomas but which are in no way related. Thus, Bloodgood calls attention to a certain type of hemangioma (fibrohemangioma [2]), which, because of hemorrhage and secondary accumulation of blood pigment, has been erroneously diagnosed xanthoma. Similar difficulties arise in hemorrhagic bursitis, hemorrhage in a lipoma, myxoma or fibromyxoma.

The cream colored subepidermal nodules, which when coalesced appear as yellowish striae in the loose skin in a case of pseudoxanthoma elasticum, is not to be confused with xanthoma. Instead of fatty degeneration there is an extensive degeneration of the deep elastic fibers of the skin. There are no foam cells, though giant cells are sometimes seen. Sugg and

1. Bloodgood, J. C.: Xanthoma, Arch. Surg. **8**: 882-917 (May) 1924; Tumors, Benign and Malignant, Progrès méd., December 1903, pp. 154-158; Malignant and Benign Tumors of the Extremities, ibid. December 1905, pp. 264-269.
2. Garrett, C. A.: Tumors of Xanthoma Type, Arch. Surg. **8**: 890 (May) 1924.
3. Geschickter, C. F., and Copeland, M. M.: Tumors of Bone, New York, American Journal of Cancer, 1931.
4. Miller, cited by Rowland, R. S.: Ann. Int. Med. **2**: 1277 (June) 1929.
5. Smith, D. T.: Giant Centrospheres in Xanthomatous Tumors, Bull. Johns Hopkins Hosp. **33**: 342 (Sept.) 1922; Method for Making a Differential Diagnosis Between Xanthomatous and Melanin Tumors from Frozen Sections, Arch. Surg. **8**: 908-917 (May) 1924.
6. Pick, Ludwig: Niemann-Pick's Disease and Other Forms of So-Called Xanthomatosis, Am. J. M. Sc. **185**: 601-618 (May) 1933. Pick, L., and Pinkus, F.: Weitere Untersuchungen zur Xanthomfrage, Dermat. Ztschr. **16**, 1909, number 12.
7. Plewes, L. W.: Nature and Origin of the Xanthoma Cell, Arch. Path. **17**: 177-186 (Feb.) 1934.

Stetson [8] reported two cases of pseudoxanthoma elasticum associated with angioid streaks of the retina and diabetes.

In fat necrosis, such as is seen in traumatic fat necrosis of the breast, the neutral fat is broken up into droplets, which are attached eccentrically to the wall of the fat cell envelop. The necrotic and liquefied areas are surrounded by abundant newly formed connective tissue. The gross appearance may resemble "xanthoma," but the microscopic changes are quite different.

In brief, the color range of a xanthic nodule is the resultant of the sum total of its preponderant fat (orange) or blood pigments (brown). In the latter instance the pigment is contained in the cytoplasm of the cells that collect these foreign bodies into clumps of irregular size and shape. It gives the prussian blue reaction for iron. In the former instance, by far the

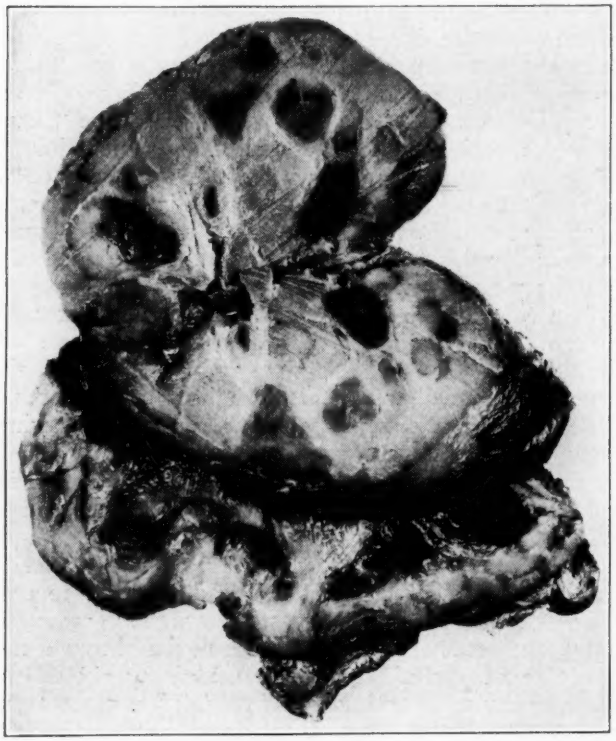

Fig. 1 (case 1).—Cross section of kidney showing diffuse "xanthomatosis."

more common and predominant feature of xanthic masses, the sudan III or scarlet red stain produces a striking picture because the accompanying lipoid globules take on a deep red. Melanin granules are usually smaller and more uniformly distributed in the cytoplasm. Melanin does not give the iron reaction but stains with silver, while iron and fat do not.

THE "FOAM CELLS"

The cytoplasm of a stained lipoid-laden cell from a xanthic mass is filled with tiny vacuoles and therefore appears meshy or "foamy" (fig. 2), because its fatty globules have been dissolved in the process of preparation. The "foam cell" therefore is considered by many as the building block of xanthoma and peculiar to it.

The cells that are adapted to the inclusion of lipoids, lipochromes, and, as already noted, blood pigments are derived from the reticulo-endothelial system. The cell elements of this system, with their remarkable affinity for dyes and particulate matter as well as lipoids, are found in the liver (Kupffer cells), the spleen and lymphoid tissues (reticulum cells), the bone marrow, the connective tissue of the body generally (the histiocytes), and the blood (monocytes). All these cells, though in different locations, are identical in nature and function and may be looked on as of a single type cell. They are scavengers, capable of locomotion and of changes in size and activity. The lipophagic response of these "resting-wandering" cells can be local or general, depending on the extent and nature of the disturbance, and results in the characteristic formations seen in a xanthic mass.

There are other cells, nonhistiocytes, that normally contain lipoids (cholesterin esters) and may appear foamy; as, for example, groups of cells in the corpus luteum, thymus, hypophysis, puerperal uterus, gallbladder mucosa, testis, thyroid, sebaceous glands, and the cortex of the adrenal. The rare occurrence of foam cells in neoplasms, the mother cells of which physiologically contain fat, has already been noted. Thus cell "foaminess" alone is not pathognomonic of a xanthic mass, and neither is the orange color; but the combination is characteristic when it represents a reticulo-endothelial lipophagic response.

THE LIPOIDS

The character of the intracellular lipoids in xanthic entities is not constant. In the localized forms one usually finds cholesterin. Chemical, physical or bacteriologic agents may liberate this ester, the presence of which incites the phagocytic properties of the histiocytes. In some of the generalized forms the infiltrations with cholesterin represent selective storage from a hypercholesteremia. In the constitutional forms the xanthomatoses, kerasin, phosphatids and cholesterol have been identified. Here there is an intense dyslipoidism, probably the result of a chromosomal or constitutional defect. A number of clinical forms have been identified. They vary in acuteness or chronicity of the process and in the extent of the xanthic infiltrations. Niemann-Pick's disease, Gaucher's disease, Hand-Schüller-Christian's disease and possibly Tay-Sachs's amaurotic family idiocy are examples. The notion as to the genotypical origin of the syndromes is further strengthened by the congenital tendency and the accompanying degenerative stigmas. It may be that xanthic granuloma palpebrarum, multiple xanthic dermatosis and xanthic granuloma diabeticorum are of a similar constitutional disturbance, though milder in degree. A hereditary tendency, obesity, diabetes and hepatic disease are frequent concomitants.

XANTHIC ENTITIES

Definition.—The usual xanthic mass has an orange color and is composed of large cells containing lipoids, commonly cholesterin. The lipoid-laden cells appear as "foam cells" when stained by ordinary methods, and the lipoid droplets are a brilliant red when sudan III or scarlet red is used. They represent the response of the reticulo-endothelial system to an excess of lipoids, either local or general. Included under xanthoma are other orange colored masses, which, however, differ in basic construction. Thus, there is the "xanthoma" of tendon sheaths, which is regarded by some as a foam cell neoplasm (or histioma or reticulo-endothelioma) and by others as a fibroma with a secondary xanthic

8. Sugg, E. S., and Stetson, D. D.: Pseudoxanthoma Elasticum, J. A. M. A. **102**: 1369-1371 (April 28) 1934.

response. "Foamy" formations are seen also in neoplasms the parent cells of which physiologically contain fat. They probably represent a local dyslipoidism but cannot be regarded as representative of a reticulo-endothelial response. Then there are other lesions which, because of an accumulation of hemosiderin, melanin, the products of fat necrosis, or elastic tissue degeneration, resemble xanthic entities and may be mistaken for them if judged by color alone.

Therefore, any classification of xanthomatous conditions will include a motley group of unrelated lesions. In the following outline an attempt has been made to place these visually similar masses under separate categories:

I. *The "Pseudoxanthomas," or, Preferably, the Xanthic Granulomas.*—These lesions are manifestations of the reticulo-endothelial response to destructive processes resulting in the accumulation of lipoids and blood and are found in:

A. Chronic inflammatory foci, such as the xanthic granulomas of sinus tracts, chronic cholecystitis or cholangeitis, appendix abscess, pyelonephritis or typhlitis.

B. Neoplasms that have undergone focal hemorrhage and fat necrosis, such as xanthic granulomas in hypernephromas, sarcomas, adrenal tumor, tumor of the testis or carcinoma of the breast.

C. Possible selective response to an unknown irritant and when a metabolic disturbance is not demonstrable, such as xanthic granuloma palpebrarum (xanthelasma) or multiple xanthic granulomas.

D. Possible response to the repeated pounding, such as occurs in the large arteries when cardiac hypertrophy and hypertension are present;[7] for example, atheroma of the aorta and its tributaries.

II. *The Xanthomatoses, or, Preferably, the Xanthic Lipoidoses.*—These occur as evidence of a reticulo-endothelial response to disturbances in lipoid metabolism, usually hypercholesteremia. Not infrequently there is an associated blood destruction with hemachromatosis.

A. Primary: Diffuse xanthic infiltrations resulting from a lipoidosis and based on a constitutional deficiency; e. g.: 1. Gaucher's disease. Foam cells store kerasin; usually in females; acute and chronic forms; enlarged spleen. 2. Niemann-Pick's disease—essential lipoid histiocytosis; foam cells store phosphatids; neutral fat is absent; usually in females; splenohepatomegaly. 3. Hand-Schüller-Christian's disease. Foam cells store cholesterol; usually in males; a chronic disease of the skeleton, with the skull predominantly affected by the foam cell infiltrations. 4. Tay-Sachs's amaurotic family idiocy, usually in males; foam cells store phosphatids; are in the ganglions and glia of the leptomeninges, in the tela choroidea and in the connective tissue about blood vessels.

B. Secondary: Xanthic nodules are sometimes seen in some cases of chronic diabetes, hepatic or renal disease associated with a hypercholesteremia. The localization in certain areas (hands, elbows, knees) may represent selective infiltration possibly resulting from local irritation. Examples are xanthoma multiplex diabeticorum and multiple xanthomatosis.

III. *Xanthic Neoplasms.*—It is a question whether true foam cell neoplasms (xanthic histiomas or reticulo-endothelioma) occur.

A. "Xanthoma" or xanthic fibroma—a benign connective tissue tumor associated with tendon sheaths or about joints. It is made up mainly of giant cells and some foam cells. The former contain blood pigment and as a result the tumor gives a positive iron reaction. It is regarded by some as a fibroma with a secondary xanthic response (xanthic fibroma). The giant cell tumors of the bone marrow and gums may also contain foam cells.

B. Lipoid storage rarely occurring in neoplastic cells whose mother cells physiologically contain fat (possibly a local dyslipoidism): Xanthocarcinoma of the prostate and adrenal; xanthome en tumeur of skin and mucous membranes.

IV. *Lesions Simulating Xanthic Entities Because of Similarity in Color.*—A. Pseudoxanthoma elasticum (subcutaneous degeneration of elastic tissue).

B. Traumatic fat necrosis of breast, and the like.

C. Fibrohemangioma.

D. Hemorrhagic bursitis.

E. Hemorrhage in a lipoma, myxoma or fibromyxoma.

F. Melanotic tumors.

The four cases that follow are examples of xanthic lesions.

The first case is that of a markedly infected kidney which, because of the yellow masses that it contained, was diagnosed at operation as a hypernephroma. Microscopic investigation, however, revealed that the golden-yellow nodulations about the pelvis and in the parenchyma (figs. 1 and 2) were composed entirely of foam cells. The kidney was diffusely inflamed and the peripelvic fat was infiltrated and necrotic. This case is an example of a generalized xanthic granulomatosis of the kidney secondary to infection. A similar condition

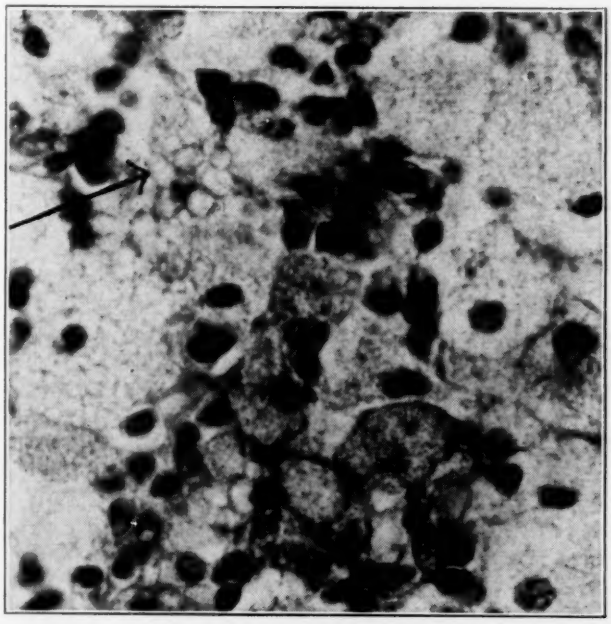

Fig. 2 (case 1).—High power magnification through cross section of a xanthic nodule from kidney, showing foam cells.

developed in a patient with pyelonephritis, which was superimposed on a "spinal bladder" following fracture of the first and second lumbar vertebrae (fig. 3).

The third case is that of a partially resected thickened ascending colon containing orange-yellow nodules. The mass was looked on as neoplastic. It communicated with a yellow sinus tract, which led to the lower pole of the right kidney and from which an "orange-colored pus" exuded. A review of the microscopic sections of the yellowish nodules showed that they were made up of "foam cells." This is an example of a xanthic granuloma associated with a typhlitis and a sinus tract, which probably arose in an infected kidney.

The last case is that of a prostate removed as an obstructing benign hypertrophy but which on section was found to contain a golden-yellow infiltration. The microscopic sections (fig. 4) revealed a carcinoma with foam cells lining the pseudo-alveoli, and containing lipoid granules when stained with sudan III. This is an example of xanthocarcinoma.

REPORT OF CASES

CASE 1.—*History.*—V. G., a man, aged 31, a Negro, admitted to the Squier Urological Clinic, Dec. 30, 1932, had had, nine years before, an attack of severe pain in the right lumbar region, which radiated anteriorly and was accompanied by hematuria. Palliative therapy by his local physician gave relief. Three years later the pain recurred without hematuria. Nine months before admission the lumbar pain returned and became steadily worse. For four months he had chills and fever; the urine became cloudy and a feeling of soreness developed over the right kidney region anteriorly. He lost 17 pounds (7.7 Kg.) in five months. Nine months before admission he had an attack of pneumonia.

Examination.—There was evidence of an unresolved pneumonia at the left base posteriorly. The patient had marked tenderness in the right lumbar and right kidney region anteriorly. There were no palpable masses. The prostate was small, firm, irregular and tender. The blood pressure was 102 systolic, 70 diastolic.

The Wassermann reaction was negative. The urine was cloudy and acid, with a specific gravity of 1.020 and a heavy trace of albumin; it was negative for sugar and diacetic acid.

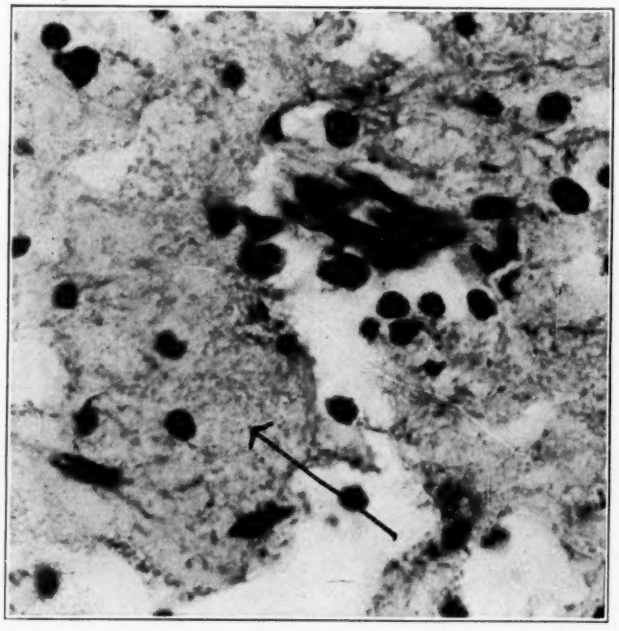

Fig. 3 (case 2).—Cross section through xanthic area of kidney.

The sediment contained pus and an occasional red blood cell. Hemoglobin was 60 per cent (Dare); red blood cells numbered 3,580,000, white blood cells 15,350; polymorphonuclear leukocytes, 94 per cent; eosinophils, 1 per cent; mononuclears, 5 per cent. The blood urea was 14.7 mg. and the blood sugar 100 mg. per hundred cubic centimeters.

Roentgen studies showed resolving pneumonia of the right lower lung and a small amount of fluid in the pleural cavity. There was a calcified shadow in the right lower ureter, also shadows suggesting prostatic calculi.

A cystoscopy, December 31, revealed that the bladder was diffusely inflamed. The right ureteral orifice exuded pus and blocked the ureteral catheter 1 cm. from the opening. The flow of urine from the left side was clear, intermittent, and negative for tubercle bacilli, white blood cells or red blood cells. It contained 0.5 mg. of urea per hundred cubic centimeters. Indigo carmine appeared in three minutes from the left kidney, and the concentration was excellent. None appeared from the right side. The roentgenograms revealed that there was no catheter up the right ureter. The calcified shadow occupied the same relative position in the lower right ureter as in the previous report. The right kidney was enlarged. The left pyelogram was negative.

The provisional diagnosis was calculus of the right lower ureter; right pyonephrosis.

Operation and Result.—Jan. 4, 1933, a right ureterolithotomy was performed by Dr. George Cahill. The ureter was found to be thickened, firm and dilated. A small hard nodule was felt just above the intramural portion. A linear incision was made over it, and a small triangular calculus was removed. Removal was followed by a profuse extravasation of thick, yellow, foul smelling, purulent material. Two cigaret drains were inserted, and a standard closure was made. The calculus was a yellow gray and measured 1 by 0.75 by 0.5 cm.

The patient had an uneventful recovery but the wound would not heal and continued to drain a large amount of pus. A cystoscopy was performed, January 25, and a catheter was passed to the right renal pelvis without obstruction. Pure pus came from that side. From 20 to 30 cc. of this purulent fluid was aspirated. A right pyelogram was made. The roentgenogram revealed that the pelvis was well filled and appreciably dilated. There was an irregularity in density and mottling of the dye in the calix, which suggested the presence of inspissated purulent material. The diagnosis was right pyonephrosis.

January 20, an intravenous urography was performed with diodrast and revealed in the immediate film that the left kidney pelvis was quite well filled and not dilated; but there was no evidence of dye in the right kidney pelvis. The fifteen minute film was the same as the preceding. In the seventy-five minute film a partial emptying of the left kidney pelvis was seen. There was no evidence of any dye in the right kidney pelvis.

January 27, a complete nephrectomy was performed by Dr. J. B. Squier on what was considered a pyonephrotic nonfunctioning kidney. At the operation the kidney was found to be adherent to the surrounding fatty tissue and was with difficulty separated from it. The surface was normal except for small pale yellow, thick firm areas in the cortex and in the pelvic fat. The yellow was striking and stood out from the surrounding tissue remarkably. The general impression was that one was dealing here with a hypernephroma of the kidney.

Pathologic Examination.—The specimen consisted of a right kidney (fig. 1), pinkish gray, measuring 12 by 6 by 4 cm. and showing a thin adherent capsule, and a fairly regular contour. The posterior surface had attached to it a somewhat irregular, smooth, dull yellow firm tissue measuring 4 by 2.5 cm. It had somewhat the appearance of adrenal tissue. However, a similar type of tissue, but only 1 cm. in length, was noted on the anterior surface. Lateral to the mass of yellow tissue was a small rounded, smooth opening entering one of the calices of the kidney. On cross section the pelvis and calices were dilated. The small areas of yellow tissue described on the outer surface were scattered throughout the calices and cortex. The cortex and medulla were in the proportion of 1:1 and 1:2, respectively. The tissue was interesting from both a macroscopic and a microscopic point of view (fig. 2). The renal tissue in the sections was so filled with chronic inflammatory cells, hyalinized and fibrous tissue that it was barely recognizable. Of particular interest were sections through the yellow areas in the cortex. These were filled with foam cells (xanthomatous areas) and fatty degeneration. Intermingled with the foam cells were fibrous strands and chronic inflammatory cells and many red blood cells. The surrounding tissue was fibrous and in places hyalinized. There was practically no functioning renal tissue in the vicinity of the fatty degeneration. Many large endothelial cells infiltrated the infected tissue. Calcium salts were deposited in a few areas. There was no evidence of a malignant condition. There were degenerative as well as regenerative phases of fat necrosis, and even though there was no evidence of giant cells this tissue may be classed under the degenerative phase of fat necrosis.

The diagnosis was xanthomatosis of the kidney; pyelonephritis.

CASE 2.—*History.*—T. G., a man, aged 27, admitted to the Squier Urological Clinic, April 9, 1934, had sustained a compression fracture of the first and second lumbar vertebrae with displacement of the fourth lumbar vertebra following a fall twenty months before. The temporary muscle paralysis gradually cleared. He was unable to void urine from the start.

Six weeks after the fall a suprapubic drain was inserted and the suprapubic sinus remained patent to date. He was observed in the ward for a time, and evidence of a right pyelonephritis developed.

Examination.—The Wassermann test with the alcoholic and cholesterin antigens was negative. Lumbar puncture was negative except for an increase in globulin and albumin. Hemoglobin was 95 per cent; the red blood cells numbered 5,090,000, and the white blood cells 12,450; polymorphonuclear leukocytes, 75 per cent; lymphocytes, 15 per cent; eosinophils, 3 per cent; myelocytes, 1 per cent, and mononuclear leukocytes, 6 per cent. The urine contained albumin and was alkaline and full of calcium oxalate and triple phosphate crystals. Microscopic examination showed mucus and pus. Smears for tuberculosis were negative.

Roentgenograms of the dorsal and lumbar spine showed narrowing of the body of the first lumbar and fusion between the twelfth dorsal and first lumbar vertebrae. There was a slight scoliosis of the upper dorsal with a concavity to the left, and a slight scoliosis of the lower lumbar with a concavity to the right. Roentgenograms of the heart and lungs were negative. A ureterogram showed the left ureteral catheter at the level of the kidney pelvis and the right at the level of the transverse process of the third lumbar vertebra. The right kidney shadow was normal in size, shape and position. There was a distortion of the right kidney pelvis, which may be due to tuberculosis, and in addition there was a sinus extending along the course of the psoas muscle and connecting with the kidney pelvis. The diagnosis was rupture of the left kidney (?).

Blood sugar was 0.92 per hundred cubic centimeters and blood cholesterol, 177 mg. per hundred cubic centimeters.

Operation and Result.—June 20 Drs. Fish and Squier performed an intracapsular nephrectomy. Gas, oxygen and ether were used. A right lumbar incision was made and the kidney exposed; it was freed with difficulty because of a marked inflammatory reaction around it. A rubber catheter was inserted round the pedicle and tied to control its position and thus lessen the danger of hemorrhage. Sutures were then applied around the pedicle, and the kidney was removed. Two cigaret drains were inserted and the standard closure was made.

Pathologic Examination.—The kidney was small, measuring 7.5 by 3.5 by 2.5 cm. The surface was coarsely lobulated and covered with punctate hemorrhages. The capsule was absent. A cross section through the pelvis lengthwise revealed a moderately dilated pelvis and blunted calices. The greater portion of the pelvic mucosa had been torn away during the operation, and what remained was diffusely red and granular. In the minor calices were plugs of blood clot. The kidney proper showed a diminished cortex. The medulla was thickened. The entire surface, by its pale glistening color, suggested a marked increase in fibrous tissue. The striking feature was the presence about the calices and in the stroma of orange-yellow nodules. These varied from 0.5 by 0.5 cm. to 1.3 by 1.0 cm. There were about eight in this particular level and all presented a remarkable picture. Microscopically (fig. 3) the kidney was the seat of a massive diffuse lymphocytic infiltration. Tubules and glomeruli were equally engulfed by this process. In places liquefaction necrosis had occurred and tiny abscesses were present. Fibrosis and hyalinization of glomeruli, converting them into huge pink staining amorphous islands in a sea of lymphocytes, produced a striking effect. The tubules were disrupted; some contained fibrinous casts. Cross sections near the pelvis showed in addition to the lymphocytic invasion a marked hemorrhagic tendency and areas filled with foam cells. These cells were large, and finely vacuolated spaces in the cytoplasm suggested that they were filled with phagocytized lipoids, which had been dissolved in the process of preparation.

The final diagnosis was xanthomatosis of the kidney, pyonephrosis, chronic suppurative pyelonephritis, abscesses in the kidney, hemorrhage in the kidney, and fibrosis in the kidney.

CASE 3.—*History.*—L. O., an American housewife, aged 44, admitted to the Presbyterian Hospital, complained of pain in the right side of the abdomen, distention and vomiting, which had lasted for three weeks. Two days before admission, retention of urine developed. Her physician gave her an injection of morphine, following which the abdominal pain subsided; she passed a large quantity of urine and the abdomen became smaller.

On admission she presented a nontender mass to the right of the umbilicus. It became more definite by pressing forward in the flank and moved slightly with respiration. After several days of observation the mass decreased and became barely palpable.

Roentgenographic studies of the abdomen showed a shadow superimposed on the right kidney and of almost the same density as the kidney. A barium colon enema indicated a slight filling defect of the ascending colon just below the hepatic flexure. Cystoscopy and pyelographic studies were negative.

The temperature ranged from 98.6 F., and the pulse was 78 and the respiration rate 20 per minute. The blood Wassermann reaction was negative. The blood urea was 1.36 mg. per hundred cubic centimeters. The stool examination was negative for blood. The urine was clear, acid and amber with a specific gravity of 1.026; there was no albumin or dextrose. The microscope revealed a few white blood cells and epithelial cells.

Fig. 4 (case 4).—High power magnification through xanthocarcinoma of prostrate, showing malignant pseudo-alveoli whose cells contain lipoid droplets which were stained with scarlet red.

Operation and Result.—The patient was operated on by Dr. A. O. Whipple. The diagnosis before operation was carcinoma of the ascending colon. The ascending colon was attached to the lateral abdominal wall for a distance of 3 cm. but was easily separated from it. Corresponding with this area and partially encircling the wall of the colon was a hard mass in which yellowish nodules were seen. An ileocolostomy was done and the ascending colon and ileum were removed. When the resected mass was lifted out a peculiar orange-colored thick "pus" was seen to exude from a tubular structure, which opened in its bed. A probe passed easily for a distance of from 12 to 15 cm. to the pole of the right kidney, where a grating and calcareous click was noted. Since it was not wished to prolong the operation, a nephrectomy was not done. The kidney region was drained by means of counterdrainage in the flank. The gallbladder was normal. The postoperative diagnosis was chronic pericolitis and chronic ureteritis.

Pathologic Examination.—The specimen consisted of a cecum, an appendix and a short portion of ileum and ascending colon.

There was a firm, irregular nodular mass on the lateral aspect of the ascending colon, 13 cm. from the fundus of the cecum. The appendix was small and embedded in an exceedingly fat mesentery. On section the appendix lumen was obliterated, and the cecum contained formed feces. The ileocolic valve was surrounded by two thick, rounded ridges, presenting a slitlike opening. The wall of the ascending colon was moderately thickened at the site of the dense mass described. A dark brown nodule, 1 by 0.3 cm., projected into the lumen of the intestine. Section through the larger mass showed a relatively dense tissue having a mottled appearance, some areas appearing white and fibrous while others were a bright yellow brown. Section through the ascending colon showed a distorted hemorrhagic mucosa, and connective tissue and smooth muscle, the structure of which was massed by a dense infiltration of mononuclear leukocytes. There was no evidence of tuberculosis or neoplasm. Scattered throughout were accumulations of foam cells with the appearance characteristic of a xanthomatous infiltration.

The final diagnosis was xanthomatous infiltrations, chronic pericolitis and chronic ureteritis.

CASE 4.—*History.*—J. G., a man, admitted to the Squier Urological Clinic, Oct. 27, 1933, had had repeated attacks of swelling of the left testicle over a period of six months, and frequency, urgency, and nocturia (six times) with incontinence, over a period of two years. He had catheterized himself twice a day for six months. He lost 28 pounds (12.7 Kg.) in eight months. The past history was negative except for gonorrhea, which he had contracted fifty years before.

Examination.—The patient was well nourished. The blood pressure was 122 systolic, 90 diastolic. The abdomen was tender in the left lumbar region anteriorly. The liver edge was palpable. The left testis was enlarged and the epididymis indurated and tender. The residual urine was 75 cc.; it was cloudy and contained many pus cells. The prostate was enlarged, firm, smooth and movable. Cystoscopy revealed a trabeculated bladder, cystitis and a bilobed prostatic intrusion.

The blood urea was 22.4 mg. and the blood sugar 105 mg. per hundred cubic centimeters. The red blood cells numbered 4,670,000 with hemoglobin 80 per cent (Dare); the white blood cells numbered 9,000; polymorphonuclear leukocytes, 67 per cent; lymphocytes, 28 per cent; eosinophils, 2 per cent; mononuclears, 3 per cent. The blood Wassermann and Kahn tests were negative.

Roentgenograms of the chest showed increased pulmonary markings throughout both lung fields, a calcified shadow in the lateral portion of the first interspace, which did not have the typical appearance of either a healed acid-fast or a metastatic lesion, smooth diaphragms, a moderately enlarged aorta, and a heart within normal limits. Of the upper genito-urinary tract both kidney shadows were normal in size, shape and position. There was an oval shadow between the tips of the second and the third transverse lumbar process, which lay perpendicular to the axis of the ureter. It did not have the typical appearance of a calculus. It would, however, have to be ruled out. There was no evidence of calculi in either kidney or upper ureter. There was a progressive arthritis of the upper dorsal and lumbar spine. The lower genito-urinary tract showed no evidence of calculi or metastatic lesions or bony pathologic changes.

The preoperative diagnosis was hypertrophy of the prostate.

Operation and Result.—October 30 a suprapubic prostatectomy was performed by Dr. George Fish with nitrous oxide-oxygen and ether anesthesia. The bladder retractor revealed a three lobed prostatic hypertrophy, which was enucleated by blunt dissection. The average amount of hemorrhage followed. Drainage was instituted by a Freyer tube, sewn into the bladder, and a cigaret drain placed in the space of Retzius.

The postoperative diagnosis was tumor of the prostate, type unknown.

The patient went into shock and anuria developed. He died fourteen hours after operation in spite of transfusion and an infusion of dextrose.

Pathologic Examination.—The specimen consisted of a large bilobed prostate measuring 5.5 by 2.5 by 4 cm. The surface presented a pinkish gray, as well as a dull, diffuse yellowish appearance. This tissue was firm. On cut surface it presented a smooth, firm, dull and dirty yellowish appearance. This tissue was in places infiltrating the fibro-adenomatous tissue. Sections that had come from the lateral lobes showed a glandular increase characteristic of the so-called benign hypertrophy of the prostate. The numerous acini were dilated in spots and closely crowded in others. They were then lined by a simple columnar epithelium. Numerous prostatic concretions were seen, as well as granular débris and desquamated cells. The fibromuscular elements were abundant and in one area they predominated, giving the impression of a fibromyomatous nodule. The sections that corresponded with the yellow areas ("capsules") showed the presence of a carcinoma. This carcinoma was unusual because of (1) the presence of lipoid granules in the epithelium lining many of the pseudo-alveoli, and (2) the relative infrequency of mitotic figures for a neoplasm of such marked activity as the intense proliferation of the cells indicated. Most of the constituent cells were small and ovoid, with round nuclei and eccentric nucleoli. Enormous grapelike clusters of these cells filled the region of the "capsule" (probably really the false capsule or old gland of the prostate, or possibly the posterior lobe), and in one area the mass had broken through and engulfed the neighboring benign looking acini. Interspersed were acini, some or all of whose lining epithelial cells were enlarged and resembled "foam cells." A scarlet red stain showed the presence of red granules—lipoid, probably cholesterol (fig. 4).

The final diagnosis was fibro-adenoma of the prostate, lateral lobes; carcinoma of the prostate, with xanthomatous changes.

SUMMARY AND CONCLUSIONS

1. The reticulo-endothelial system is important as an entity and as a mechanism responding to accumulations or excess of lipoids and particulate matter.

2. Accumulations of lipoids may result from inflammatory, traumatic or deficiency causes.

3. The lipophagic response by cells of the reticulo-endothelial system results in the formation of a xanthic mass.

4. The cell unit of the xanthic mass is the foam cell. The foaminess results from the solution of cell lipoids during the routine process of preparation. Should scarlet red be used, the lipoids then appear as red, intracellular droplets.

5. The orange color of a xanthic mass is due mainly to a combination of its lipoids and lipoid pigment content, and to a lesser degree to its blood pigment.

6. An outline of xanthic entities, which has been included, embraces the xanthic granulomas, the xanthic lipoidoses, and the so-called xanthoma and calls attention to lesions that resemble them in color but are basically different.

7. In two cases, unusually extensive "xanthomatosis" of the kidney was present, and in one case a seemingly similar condition was found in a carcinoma of the prostate.

911 Park Avenue.

Language and the Human Mind.—Language as heard and spoken long preceded civilization, and has been recorded as cuneiform and hieroglyphic writing by the early civilizations of Mesopotamia and Egypt, and much earlier as crude pictorial representations. In one form or another language has exerted such a powerful influence on the evolution of mind in man and is so intimately associated with this that it causes no surprise that the one is so commonly regarded as the equivalent of the other. This, however, is by no means the case, language being merely the symbolical instrument of mind and not its compeer, although in some form or equivalent it is indispensable for the full evolution of the complex cerebral changes whose final end is individually acquired skilled psychomotor activity.—Bolton, J. S.: The Evolution of Mind, *Lancet* **1**:728 (March 30) 1935.

GLOMUS TUMORS

(ARTERIAL ANGIONEUROMYOMA OF MASSON)

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In the Laboratory of Surgical Pathology of Johns Hopkins Hospital is a tumor that was removed from the end of the little finger of the right hand in November 1924. This tumor, it is stated in the history, had no definite capsule. It was regarded as a neurofibroma, but the epithelioid cells and the vascular spaces in it could not be satisfactorily interpreted.

CASE 1.—The patient from whom this tumor was removed was a white woman, aged 38. Eight years before the tumor was removed the patient experienced severe, sharp pain in the tip of the little finger of the right hand. Five years later, that is, three years before removal, an incision was made and a curettement performed, as a diagnosis of periostitis ("a bone bruise") had been made. After this operation a distinct tumor was discovered. The tumor was very painful when pressed on, and definite painful sensations were experienced with alterations in temperature, from heat to cold, and vice versa. A small mass could be palpated beneath the skin on the palmar surface of the terminal phalanx of the little finger. To the ulnar side of the tumor could be seen the scar of the former operation.

As stated in the history, a histologic diagnosis of the tumor was not made. The vascular space and the groups of epithelioid cells raised some doubt as to the diagnosis, and at that time no interpretation of their character was attempted.

The following three cases presented tumors histologically like the one just referred to:

CASE 2.—A white man, aged 67, recently admitted to the surgical clinic, complained of severe, often excruciating, pain about the left knee, which radiated into the thigh and leg. The pain was thought to be a sequela of a fracture sustained many years before. An operation had been performed to correct the displacement.

On examination a small tumor approximately the size of a lima bean was found just in front of the middle of the patella on the left side. The patient experienced excruciating pain when pressure was made on the tumor, even when it was struck by the end of his overcoat or rubbed by his trousers. Shortly before entering the hospital the patient's wife accidentally dropped a newspaper on the tumor. Even this insult caused excruciating pain. This small tumor was freely movable, somewhat irregular in shape and, as stated, extremely painful. The skin covering the tumor seemed normal. The tumor was excised under local anesthesia.

Microscopic examination revealed many blood spaces, between which were epithelioid cells. Histologically this tumor was much like the one in case 1, removed in 1924, the histologic diagnosis of which was not definitely made.

CASE 3.—A white woman, aged 67, had noted a small mass just below the right elbow a little to the outer side for fifteen years. During the past five years the mass had not increased in size. The mass had been extremely painful for the past nine months and pressure on the mass would cause paroxysms of pain. The tumor was removed under local anesthesia in September 1930. It was located just beneath the skin and embedded in the fat. It was composed of soft, spongy, red tissue like that of an angioma and was surrounded by fibromyxomatous tissue. At operation it was thought to be an angioma; the preoperative diagnosis had been neurinoma. There has been no recurrence of this tumor.

Histologically there were areas which resembled those of cavernous hemangioma, and between these were epithelial-like cells, which resembled those seen in a melanoma. Nerve fibers were found in the tumor, which was surrounded by a fibrous capsule.

CASE 4.—A white woman, aged 38, for three years prior to 1929 had had pain in the end of the right thumb. A diagnosis of a felon was made, and the thumb was lanced several times in the spring of 1929. In the fall of that year a roentgenogram revealed a dark shadow over the bone. The terminal phalanx was exposed and curetted, and drains were kept in place for the next two weeks. In November 1930 the patient entered a hospital, where the diagnosis of Ewing's tumor was made from the tissue removed at that time. The thumb and the axilla were irradiated. The patient then returned home, where she received a second course of roentgen treatments in 1931, the thumb and axilla being irradiated. In 1932 she returned to the hospital, and the thumb and axilla were again irradiated. Following this a slight swelling of the thumb and axilla, accompanied by pain, developed. She returned home and received a fourth course of irradiation in November 1932. The family had been notified that the case was hopeless.

When seen by us nothing could be palpated in the axilla except what seemed to be fat, probably altered by the roentgen exposure. The hand and chest were normal.

Fig. 1.—Glomus tumor in a woman, aged 67. This tumor had been noted for fifteen years. There was no increase in size over a period of five years. Nine months before removal the tumor had become extremely painful. Pressure on the tumor caused excruciating paroxysms of pain.

The sections that had previously been made were examined and a diagnosis of a benign glomus tumor was made. The patient returned home, and when last seen in 1934 she was well. Recent word indicates that she has continued to be well.

These four histories have been given in some detail, for in them are related the symptoms associated with tumors described by Masson in 1924 as glomus tumors or arterial angioneuromyomas. The name glomus was applied by Masson because of the histologic likeness of these tumors to the glomus coccygeum of Luschka. He described three such growths, one in the forearm, two in the thigh, which had a definite and characteristic structure. Masson thought that the like clinical symptoms warranted him in concluding that he was dealing with a new type of tumor—a morbid entity. In 1925 Martin and Dechaume reported two cases that were identical histologically with those described by Masson. It was thought that these tumors developed from the arterial glomus, which is considered a normal organ. The development from the glomus accounts for the

From the Laboratory of Surgical Pathology of the Johns Hopkins Hospital.

frequent subungual location. As will be seen from the histories, such tumors may occur in other locations.

The majority of the cells forming the glomus resemble epithelial cells. The nuclei are large and round and contain a nucleolus. The chromatin stains with only average intensity. The protoplasm is acidophilic. These cells are found in the neighborhood of blood vessels, and in places they seem to have a circular arrangement

Fig. 2.—Cross section of a glomus tumor removed from in front of the left patella. The capsule, angioma-like spaces and epithelioid cells distributed between the blood spaces may be seen.

and are distinguished with difficulty from the smooth muscle fibers. These cells, resembling epithelium, are polygonal and clear. The cells surround the vessels in areas almost like endothelium and are separated by just a thin layer of collagen fibers.

Popoff [1] has recently described a peripheral arteriovenous anastomosis. We shall refer to this frequently in discussing the origin and microscopic changes of the tumors under discussion. Sucquet was apparently the first to describe peculiar vessels in several regions of the palm and sole, especially in the midzone on the ventral surface of the fingers and toes, which were larger than the ordinary capillaries and emptied directly into veins without an intervening capillary network. According to Popoff, these arteriovenous anastomoses are found almost exclusively over the ventral surface of the hand and foot. They are constantly present in the region of the nail bed and in the tips of the digits, the palmar surface of the first, second and third phalanges, and the thenar and hypothenar eminences of the hand. A like distribution is found in the foot, but they are also found about the heel. The anastomosis is usually S shape, twisting and coiling, seldom straight.

The histologic picture of the anastomosis is repeated in the tumor. The lumens are usually narrow and irregular. The endothelial cells are large and cuboidal and arranged in two or three rows. The muscular coat of the vessels is composed of an inner longitudinal and an outer circular layer, but these are indistinct. Among the muscle cells are large, clear, epithelioid cells with oval or globular nuclei that have little chromatin. Ramifying among these cells are anastomosing cells with elongated nuclei and transparent cytoplasm without myofibrils. The outer zone of the arteriovenous anastomosis is made up of loose, delicate, collagenic reticulum, in which may be found many nonmedullated nerve fibers. The anastomosis is surrounded by coarse, lamellated, collagenic tissue, in which are found the collecting veins.

It is suggested by Masson, Popoff and others that the glomus controls the arteriovenous circulation in the digits and aids in regulating both the local and the general body temperature.

The histologic appearance of glomus tumors in indicated by the accompanying photomicrographs. Figure 2 shows under low power a cross section of such a tumor. In this are shown the capsule made up of rather heavy connective tissue fibers, the blood spaces resembling those of a cavernous angioma, and the epithelioid cells, which are distributed throughout the tumor. Scattered throughout are nerve fibers. Figures 2 and 3 indicate the cellular characteristics and appearances better than any written description.

The glomus tumor, as has already been implied, occurs most frequently in the nail bed and about the fingers and toes—in those places in which the glomus occurs with greatest frequency and abundance. They are by no means limited to these areas, however, for

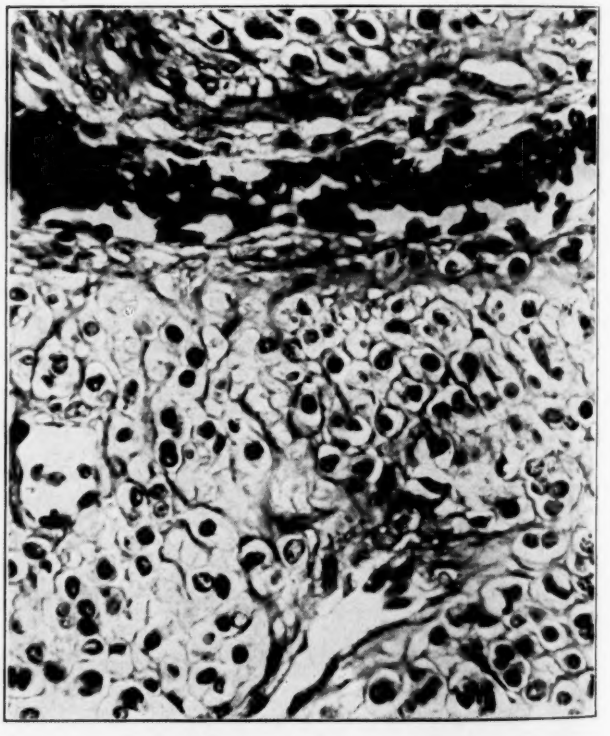

Fig. 3.—Section showing characteristics of the cells found in glomus tumors. These cells form a mantle for some of the vascular spaces.

thirteen of the seventeen cases that we have observed have developed in other locations, such as the elbow, the knee, the leg, and the palm of the hand.

Clinically the most striking characteristic of the glomus tumor is pain, spontaneous and provoked. The pain is excruciating at times. Pain of such severity is not found in a neurinoma. These tumors usually are smaller than the neurinoma and are not situated on a

1. Popoff, N. W.: The Digital Vascular System, Arch. Path. **18**: 295 (Sept.) 1934.

large peripheral nerve. When these occur in the nail bed they usually have a cyanotic appearance, which is almost pathognomonic. In some instances vasomotor disturbances are quite marked. A glomus tumor should always be looked for when the patient experiences severe pain in the hand over a long period. The nature of the lesion should be suspected when a tumor that is excruciatingly painful occurs in other regions and

Fig. 4.—Cross section of a glomus tumor under a higher magnification than shown in figure 2.

reacts by pain to pressure or touching, much like the trigger zone in tic douloureux. In the hands a marked atrophy may develop. This is the atrophy of disuse, because any motion may bring on a paroxysm of pain.

A mistaken diagnosis is not infrequently made in such cases. The diagnoses probably most frequently made are endothelioma and angiosarcoma. At times these tumors, which are encapsulated and benign, are regarded as malignant.

A short summary follows of the remaining thirteen cases that we have studied:

CASE 5.—A white man, aged 65, had a tumor situated on the forearm. The tumor was removed elsewhere and sent to the hospital for diagnosis. A microscopic diagnosis of perithelial angiosarcoma had been made. The patient was well five years after local removal. The histologic diagnosis made in the laboratory of the Johns Hopkins Hospital was glomus tumor.

CASE 6.—A white man, aged 47, had noticed a small mass about the size of a pea on the right thigh just above and internal to the great trochanter. This small tumor had caused pain and was tender. Nine years before the tumor was removed it had been lanced. The tumor had gradually increased in size and was painful. It was removed in November 1909.

CASE 7.—A white woman, aged 30, had noticed a small mass under the skin of the thigh three months before she was seen. This tumor was painful (spontaneous and provoked) but not excessively so. In May 1933 the tumor was removed. It proved on section to be a typical glomus tumor.

CASE 8.—A physician stated that he had noticed for many years a small tumor on the anterior aspect of his right leg. This he believed followed trauma. During the past year he noticed a slight increase in the size of the tumor. The tumor was removed in May 1926, a wide margin being given the tumor. The tumor seemed to be of the angiomatous type. The large epithelioid cells found in the tumor were thought to indicate malignancy. The patient was reported well in 1928, two years later.

CASE 9.—A white man, aged 57, had a small tumor removed from the subcutaneous tissue about the knee. The growth was definitely encapsulated and thought to be a hemangioma. Histologically the tumor was typical of the glomus group. It was sent to the laboratory for diagnosis because the cells surrounding and between the vascular spaces had caused some confusion.

CASE 10.—A graduate nurse had a tumor in the palm of the hand. The small tumor was exceedingly painful. When examined histologically after removal it proved to be a typical glomus tumor.

CASE 11.—A Negro, aged 48, had a small growth on the flexor surface of the left arm near the elbow. When first noted it was the size of a pinhead, but it gradually and very slowly increased in size. Dull pain was felt in the arm all the time. This was aggravated by motion or by striking the tumor. The tumor, when it was removed, measured 2 cm. in diameter.

CASE 12.—A white woman, aged 60, complained of pain in the finger, almost constant, of fifteen years' duration. There were practically no physical changes, except slight edema. There was marked pulsation on the inner border of the index finger. A definite tumor was palpated here. There was a

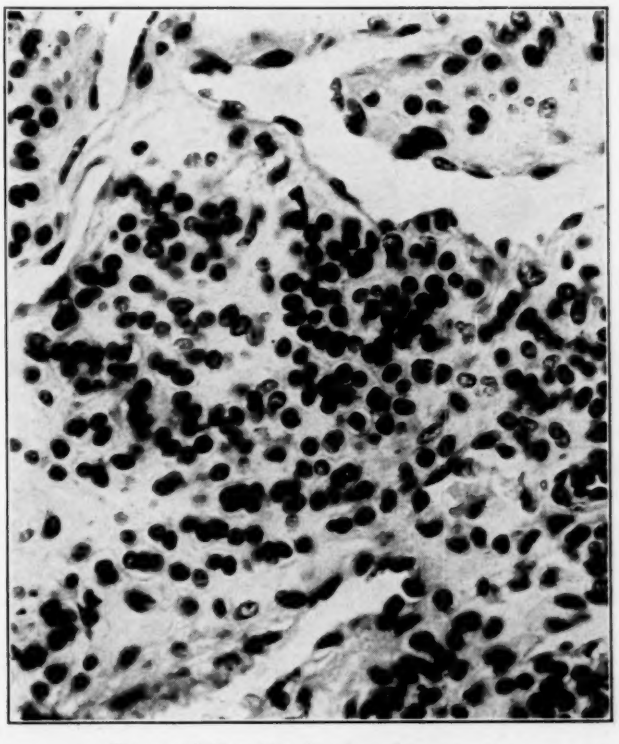

Fig. 5.—Epithelioid cells of a glomus tumor.

lipoma on the dorsum of the right foot. The tumor on the finger was excised and on microscopic examination showed typical angiomatous spaces surrounded by epithelioid cells.

CASE 13.—A white man, aged 29, a draftsman, had fallen six years before and injured his left elbow. A small, bluish, sensitive tumor appeared on the left forearm about 2 inches from the tip of the olecranon. This was removed after about three years of slow growth but recurred and gradually increased until it was the size of a large pea. It was painful when he rested his arm on the drawing boards. Examination

revealed a tumor about 8 mm. in diameter, apparently a hemangiomatous mass near the left elbow. The tumor was excised under local anesthesia and proved to be definitely encapsulated.

CASE 14.—A white man had had a mass on his left wrist for the past eight years. He had no pain except when attempting to lift heavy things. The mass was freely movable, round, well circumscribed, cystic, and the size of a walnut. The mass was excised. The specimen consisted of an oval skin flap 3 cm. long and 1.5 cm. in maximum diameter, excised with the underlying tissue for a distance of 2 mm. Lying directly beneath the skin a rounded, soft, circumscribed mass was found, which measured 1.5 cm. in diameter and 8 mm. in thickness. The mass lay directly beneath the epidermis. It was encapsulated, and the capsule has been shelled out from the underlying tissues.

CASE 15.—A white man, aged 80, had a tumor removed from the dorsal surface of the hand, between the index and middle fingers. The tumor was excised and the material sent to the laboratory for microscopic examination. No further clinical data are available.

CASE 16.—A white man, aged 51, seen in the dispensary, April 12, 1935, was diagnosed as having syphilis with involvement of the central nervous system, cardiac insufficiency and first degree heart block. During the examination a small bluish mass the size of a large lima bean was discovered on the extensor surface of the right elbow. The mass was freely movable and extremely painful when touched or pressed on.

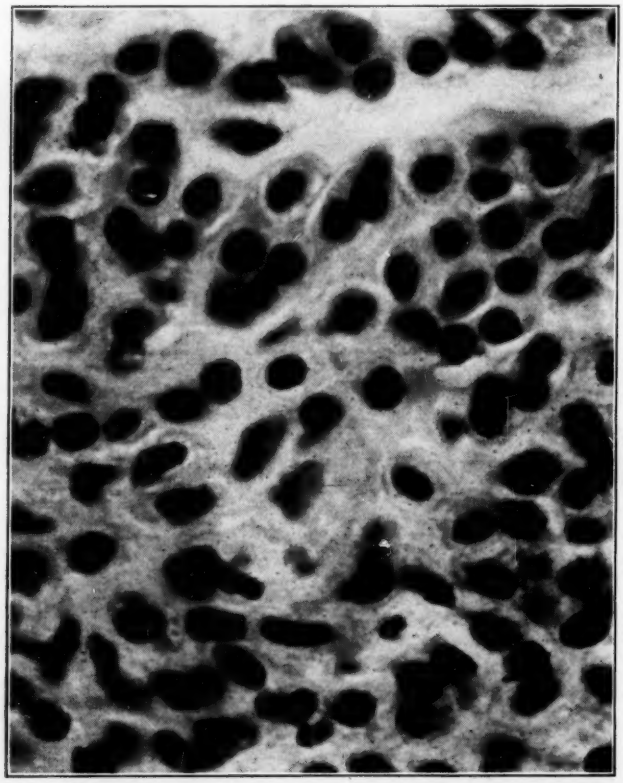

Fig. 6.—Relation of the epithelioid cells to the blood spaces in the tumor.

The mass appeared about twelve years before and grew to the present size in two years. It had gradually become more tender. The patient was frequently awakened at night, because of pain that was caused when the mass was rubbed by the bed or night clothing. A diagnosis of a glomus tumor was made. The patient was referred to the division of surgery, and the mass was removed. Extreme pain was complained of when an attempt was made to inject procaine hydrochloride. On histologic examination the tumor was found to have the typical structure of a glomus.

CASE 17.—A white woman, aged 24, was examined because of a painful, bluish tumor beneath the right thumb nail about 1 mm. in diameter. The pain had been present for one month and had been more severe for the past two weeks, extending up the arm to the shoulder. The overlying nail was slightly irregular. A roentgenogram made of the distal phalanx of the thumb showed a minute area of rarefaction beneath the tumor site. The tumor was excised together with the entire nail and the surrounding soft parts. It was in contact with the nail above and the bone beneath. On gross examination it was found to be circumscribed and was about 2 mm. in diameter. From frozen sections made at the time of operation it was thought to be a round cell sarcoma of the Ewing type, and postoperative irradiation was given. Examination of a permanent section showed a typical glomus tumor, with numerous capillary spaces surrounded by epithelioid cells. The patient has remained well, now more than five years.

THERAPEUTIC RESULTS WITH THE KETOGENIC DIET IN URINARY INFECTIONS

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The successful use of the ketogenic diet in the treatment of urinary infections is dependent on the bactericidal action of beta-oxybutyric acid at a certain degree of acidity. The limit at which this action occurs has been shown to be 0.5 per cent beta-oxybutyric acid and a p_H of below 5.5. An increase in the concentration of the acid and a decrease in the p_H increase the bactericidal power of the urine. In like manner, it has been shown that bactericidal action occurred below the minimal concentration when the p_H of the urine was lowered and that bactericidal action was present at a p_H above 5.5 when the concentration of the beta-oxybutyric acid was increased considerably. At a p_H of 5.7 a concentration of 1.8 per cent beta-oxybutyric acid showed a bactericidal action, and at a p_H of 5.0 a concentration of 0.4 per cent acted similarly.[1] It has been demonstrated by Osterberg and Helmholz[2] that the necessary concentration of beta-oxybutyric acid can be determined by a relatively simple method. By means of chlorphenol red paper a p_H below 5.5 can be estimated.

It has been said that the ketogenic diet kills the colon bacillus more readily than it does other members of this group.[3] Clinically, in my experience, it has proved true that the colon bacillus usually was the first organism to disappear from the urine when more than one organism was present. In a series of cases in which the urinary tract was infected with Escherichia coli, Aerobacter aerogenes, Proteus vulgaris, Staphylococcus, Streptococcus and Pseudomonas, the diet has acted very satisfactorily. Similar results have been obtained in experiments in vitro with these organisms. That with one organism the infection is more deeply seated than with another, so that the former organism cannot be acted on as successfully as the latter, is quite possible.

Knowing what conditions must be achieved before bactericidal action is possible, it becomes a question if, and how readily, these conditions can be achieved in cases of urinary infection.

From the Section on Pediatrics, the Mayo Clinic.
Read before the Section on Pediatrics at the Fifty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

1. Helmholz, H. F., and Osterberg, A. E.: The Bactericidal Effect of Levorotatory and Racemic Beta-Oxybutyric Acid (unpublished data).
2. Osterberg, A. E., and Helmholz, H. F.: Determination Whether Ketonurine Has Bactericidal Action: A Simple Technic for Clinical Use, J. A. M. A. **102**: 1831-1832 (June 2) 1934.
3. Crance, A. M.: The Necessity for the Standardization of the Treatment of Bacilluria, J. A. M. A. **104**: 285-288 (Jan. 26) 1935. Clark, A. L., and Keltz, B. F.: A Simplified Treatment of Bacilluria, ibid. **104**: 289-292 (Jan. 26) 1935.

The formation of the ketone bodies is dependent on the inability of the body to oxidize large amounts of fat in the absence of available carbohydrate. It becomes necessary, therefore, to feed patients large amounts of fat and very small amounts of carbohydrate. Some few children do not tolerate these large amounts of fat. They suffer from digestive disturbances and are not able to continue with the diet. Others, again, seem to have no difficulty in retaining the diet but do not seem to absorb the necessary amounts of fat to produce a good ketosis. The urine of two infants who received a diet in which the ketogenic-antiketogenic ratio was respectively 4:1 and 5:1 showed at no time a p_H below 5.7 or more than 0.1 per cent beta-oxybutyric acid. Large amounts of fat were found in the stools.

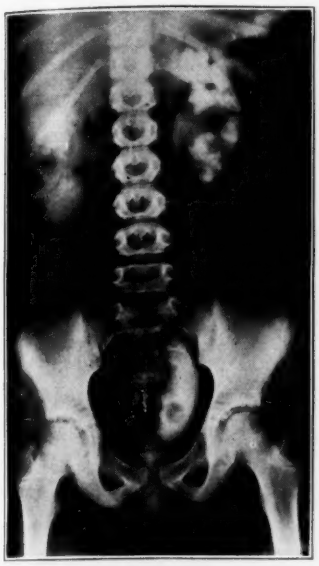

Fig. 1.—Bilteral hydronephrosis with megalo-ureter on left side.

The greatest difficulties were encountered in the cases in which renal function was decreased. The diseased kidneys were unable to excrete a urine that had a low p_H and a high concentration of beta-oxybutyric acid. In cases in which urine has been obtained separately from the two kidneys, the urine that was obtained from the kidney which was more severely damaged was more alkaline and contained less beta-oxybutyric acid than did the urine that was obtained from the other kidney. In cases in which the value for the urea was more than 50 mg. per hundred cubic centimeters of blood, the patients seem to have difficulty in excreting a urine that has a high concentration of beta-oxybutyric acid.

Stones that remain in place also seem to be an absolute obstacle to successful treatment of a urinary infection. In one case in which bilateral renal calculi had been removed, two small stones again developed on one side. In spite of the adequate ketosis and a low p_H, the urine from the kidney with the pelvic stones always remained loaded with bacteria.

The ketogenic diet in childhood is to be reserved for infections that do not respond to simple therapeutic procedures. To treat every child who has an acute urinary infection with the ketogenic diet would be entirely unnecessary. The majority get well and the urine becomes sterile with the usual alkalinization and forcing of fluids. In some cases it later may be necessary to give ammonium chloride and methenamine for a short time. A small group remains in which there is no obstruction of the urinary tract but in which the infection becomes chronic in spite of the usual types of treatment. The infection will usually clear up promptly as a result of administration of the ketogenic diet.

URINARY INFECTION WITHOUT OBSTRUCTION

I have tried out the ketogenic diet in a series of twenty-four cases of infection of the urinary tract without obstruction. In some of these cases the infection probably would have been cleared up just as readily by other means as it was with the diet, but in order to test out the efficacy of this new mode of treatment the dietary treatment was used. In all cases in which the necessary concentration of beta-oxybutyric acid and the proper p_H could be obtained, the urinary infection cleared up very promptly. There were several instances in which the urine was sterile after forty-eight hours. In a number of these cases, ammonium chloride and methenamine had been tried without success.

The twenty-four cases have been divided into three groups: (1) those in which the infection cleared up promptly as a result of the diet and in which the patient remained free from infection; (2) those in which the infection cleared up promptly but recurred, and (3) those in which the infection did not respond to the treatment, because the proper p_H and the necessary concentration of beta-oxybutyric acid could not be obtained in the urine. Twenty-one of the patients in this series were girls and only three were boys.

In the fifteen cases (table 1) in which there was no return of the infection, the cure was often extremely rapid. The number of days that the diet was administered does not indicate the length of time it took to render the urine sterile but the length of time it took to obtain a proper ketosis and the period that I felt it was necessary to keep the urine sterile in order to assure that all the organisms in the lining of the urinary passages would be killed. It is noted that, in most instances in which the necessary bactericidal conditions are achieved, the urine becomes sterile within twenty-four hours. As a rule, the ketogenic-antiketogenic ratio at which a proper ketosis is obtained lies between 3:1 and 4:1. In one instance in which sterilization of the urine of a 3 year old girl was complete after seven meals, the ratio was only 2:1.

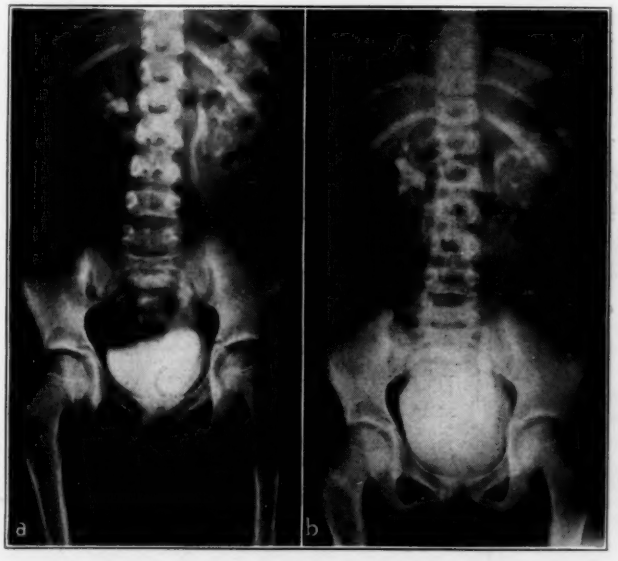

Fig. 2.—Duplication of left ureter with megalo-ureter: *a*, before operation; *b*, after operation.

In the six cases in the second group (table 2), there was a marked tendency for the infection to relapse. Three of these patients lived near the clinic and the various recurrences of the urinary infection could be followed for a period of years. The urine of two other patients was sterile when they left the clinic but the infection recurred soon after they arrived home. Another patient returned in six weeks for a second dietary treatment and has not had a recurrence of the infection for about a year.

The third group was composed of three cases in which I was unable to obtain a proper ketosis or a low p_H in spite of the fact that the children took the diet without difficulty (table 3). In one of these cases the ketogenic-antiketogenic ratio was 5 : 1. In two cases the lowest p_H of the urine was 5.7 and 5.9, respectively,

TABLE 1.—*Treatment of Urinary Infection Without Obstruction: Sterilization of Urine* *

Case	Age, Years	Sex	Diet Continued, Days	Urine: p_H	Urine: B-Oxybutyric Acid, per Cent	Comment
1	10	♀	11	5.0		
2	12	♀	6	5.1		
3	8	♀	4			
4	3	♀	4	...	.....	Urine sterile after seven meals
5	6	♀	6	5.1	.....	Aerobacter aerogenes
6	6	♀	6	5.0	.....	Urine sterile after six meals
7	5	♀	7	4.8		
8	7	♀	8	5.1	.....	Urine sterile after three days
9	6	♀	9	5.3	.....	Slight ureterectasis on right side
10	11	♀	5	5.0	1.5	Streptococcus faecalis; urine sterile after six meals
11	9	♀	30	...	.....	No results with ammonium chloride and methenamine; patient went home to continue diet; urine sterile when patient returned one month later
12	4	♀	7	5.2	Greater than 0.5	
13	13	♂	22	5.0	.....	Staphylococcus aureus; osteomyelitis and abscess of brain
14	8	♀	8	5.1	Greater than 0.5	Anaerobic streptococcus and Escherichia coli; chronic urethritis
15	8	♀	9	...	Greater than 0.5	Urine sterile one year later

* All organisms Escherichia coli except when indicated differently.

and at no time did the concentration of the beta-oxybutyric acid approach 0.5 per cent. These two patients were in the hospital, and I was unable to account for the lack of adequate ketosis. A second trial of the diet unfortunately was not possible. In case 24 (table 3) the p_H ranged from 5.1 to 6.1. On

TABLE 2.—*Treatment of Urinary Infection Without Obstruction: Recurrence of Infection and Repeated Sterilization of the Urine* *

Case	Age, Years	Sex	Diet Continued, Days	Urine: p_H	Urine: B-Oxybutyric Acid, per Cent	Comment
16	10	♀	6	5.0	Greater than 0.5	Recurrence after six weeks; second cure; no recurrence since 6/9/33
17	5	♀	10	5.3	0.56	Aerobacter aerogenes; relapse
18	1	♀	15	5.0	.....	Relapse with Streptococcus faecalis
19	9	♀	10	5.3	Greater than 0.5	Repeated cures and recurrences; no relapse for more than a year
20	10	♀	7, 6, 4	5.3	Greater than 0.5	Repeated cures and recurrences; no recurrence since 9/27/34
21	10	♀	4	5.3	Greater than 0.5	No result with ammonium chloride and methenamine; repeated cures and recurrences

* All organisms Escherichia coli except when indicated differently.

the fifth day there were only 100 organisms in 0.5 cc. of urine. The p_H of the urine on this day was 5.6; it rose on the following days and reached 6.1 on the eighth day, at which time there were innumerable bacteria in 0.5 cc. of urine.

It is thus evident that the ketogenic diet should be reserved for those cases in which urinary infection is refractory to the ordinary modes of treatment. No one should hope for beneficial results unless a weighed diet can be arranged for and the proper degree of ketosis and acidity can be achieved.

URINARY INFECTION WITH OBSTRUCTION

In cases in which urinary infection has been associated with anomalies of the urinary tract, it has been unusually difficult in the past to eliminate the infection. In the past fifteen years I have treated a large number of children with anomalies, by various means, and in only two cases have I been successful in rendering the urine sterile and having it remain so after the treatment has been discontinued. In the one case there was a relapse within a month, and in the other case there was a relapse within a year. The lack of therapeutic results in these cases has been so striking that, together with others, I have felt that, if a cure was not achieved after active treatment had been employed for from three to four weeks, the patient probably had an anomaly of the urinary tract, with urinary stasis.

It was a great surprise, therefore, that the ketogenic diet would successfully clear up urinary infections in the presence of even severe degrees of stasis. My first

TABLE 3.—*Treatment of Urinary Infection Without Obstruction: Failure of Diet* *

Case	Age, Years	Sex	Diet Continued, Days	Urine: p_H	Urine: B-Oxybutyric Acid, per Cent	Comment
22	1	♀	10	5.9	Less than 0.5	No results; ketogenic-antiketogenic ratio 4 to 1
23	3	♂	14	5.7 to 6.1	Less than 0.5	No results; ketogenic-antiketogenic ratio 5 to 1
24	8	♂	13	5.1 to 6.1	.....	Bacillus proteus; hypospadias; one culture revealed 100 organisms per 0.5 cc. of urine; p_H was down to 5.6 on this day

* All organisms Escherichia coli except when indicated differently.

report on the subject emphasized the excellent results in cases in which there was stasis in the urinary tract, because it was this group, in particular, in which my treatment had been almost always unsuccessful.

In a series of twenty-one cases of urinary infection there were a great variety of severe obstructive lesions of the urinary tract. A bactericidal urine cannot do more than kill the bacteria with which it comes in contact, so that the vesical, ureteral or pelvic wall when seriously infected or an interstitial lesion of the kidney can be influenced only indirectly by the diet. The urinary tract finally may be rendered sterile if, by rendering the urine sterile, further infection of the tissues is prevented and normal healing of the lesions is allowed to take place. As the urine can be rendered bactericidal by means of the diet, there is no reason why it should not sterilize a urinary tract that is the seat of stasis as well as one that is not.

I have divided the twenty-one cases into (1) a group of six cases in which the urinary tract has remained free from infection for a period of time after discontinuing the diet, (2) a group of five in which there has been a recurrence after a period of freedom from infection after discontinuing the diet, and (3) a group of ten cases in which it was impossible to influence the infection at any time.

GROUP 1.—As will be seen from table 4, the patients who are included in this group had normal renal function. In no case was the value for the urea more than

38 mg. per hundred cubic centimeters of blood, and all these patients excreted a urine that had a low p_H and a high concentration of beta-oxybutyric acid. The obstruction in these cases was of such a nature that, even after the operative procedure, there still remained sufficient dilatation of the urinary tract to render it abnormal.

Two recent cases seem worthy of detailed description, because they show the severity of lesions that can be cleared up in cases in which operative procedures at the present time offer no solution, and the rapidity with which infection may clear up after relief of the main obstruction:

CASE 2 (table 4).—A girl, aged 8 years, had a bilateral hydronephrosis and megalo-ureters, without any obstruction in the ureter, bladder or urethra. The condition probably was of neurogenic origin. (The excretory urogram is illustrated in figure 1.) The patient had nephrostomy tubes in both kidneys. There was an acute infection and mucopus was draining from the tubes. Two previous attempts with the diet ended in failure. These were followed by a protracted period of unsuccessful treatment with urinary antiseptics. A third attempt with the diet, after both nephrostomy tubes had been removed, was successful. This probably was as severe an infection as I have seen and one in which a final attempt was made with what appeared to be a hopeless case, with a surprising result (table 5). The urine has remained sterile for eighteen months.

TABLE 4.—*Treatment of Urinary Infection with Obstruction: Sterilization of Urine Without Relapse*

Case	Age, Years, and Sex	Anomalies	Urea, Mg. per 100 Cc. of Blood	Diet Continued, Days	Urine: p_H	Urine: B-Oxybutyric Acid, per Cent	Comment
1	8 ♂	Hydronephrosis	24	5	5.5	.....	Cutting of aberrant vessels one year later
2	8 ♀	Bilateral hydronephrosis; megalo-ureters	24	6	5.3	0.87	Bilateral nephrostomy
3	9 ♀	Duplication of ureters; left ureterocele	38	9	5.2	1.0	Ureteromeatotomy
4	9 ♀	Megalo-ureters; atony of bladder	36	8	5.1		
5	7 ♀	Right pyonephrosis	28	10	5.0	Greater than 0.5	Nephropexy
6	8 ♀	Neuromuscular dysfunction of bladder	26	10	5.1	Greater than 0.5	Urine sterile one week after discontinuance of diet

CASE 3 (table 4).—A girl, aged 9 years, had a duplication of the ureter and pelvis of the left kidney, and a marked dilatation of the lower third of each ureter. (The excretory urogram is shown in figure 2.) The ureter from the upper segment entered the bladder through a pin-point meatus; that from the lower segment entered the bladder through a gaping meatus. Meatotomy was performed on the ureter, which was 3 cm. in diameter. One month after operation the diameter of this ureter was 1.7 cm. The ketogenic diet was started eight days after operation, and the urine was sterile after twelve days (table 6).

GROUP 2.—This group consists of five cases with equally severe obstructive lesions in which there was a complete sterilization of the urinary tract, but, after a varying interval of from a few days to as long as seven months, there was a relapse (table 7). In one case there was a marked tendency for the infection to relapse until local treatment of the bladder and dilated ureteral stump was used. The urine has been sterile for seven months.

GROUP 3.—This group includes the ten cases in which the ketogenic diet failed to sterilize the urine (table 8). This group of ten cases can be subdivided into a group of five cases in which stones were present and a group of five cases in which no stones were present. In the only case in which the amount of urea in the blood was increased when the patient was admitted to the hospital, it dropped rapidly to normal after removal of putty-like material from the pelvis of a solitary kidney. In only one of the five cases in which stones were present was it possible to get the p_H of the urine below 5.5. It was possible in this case to lower the p_H to 5.2 and to increase the concentration of beta-oxybutyric acid to 1.4 per cent. This patient had a double urinary infection with Streptococcus faecalis and gram-negative bacilli when she was first seen at the clinic. Ureteral catheterization, while the diet was being employed, revealed that the urine from the kidney without stones was sterile and that a culture of the urine which was obtained from the calculous kidney was positive for Streptococcus but negative for Escherichia coli. Stones had been removed from both kidneys, but two small stones had formed later in the left kidney. In two of the other cases in which there were stones the p_H of the urine could not be brought below 6.1 and 8.3, respectively. Although in the latter case the concentration of beta-oxybutyric acid at one determination was 1.4 per cent, it was never more than 0.22 per cent in the former case.

TABLE 5.—*Clinical Data in Case 2, Table 4*

Date	Diet, Gm.: Carbohydrate	Protein	Fat	Urine: p_H*	B-Oxybutyric Acid	Albumin, Grade	Pus, Grade	Gram-Negative Bacilli
12/19/33	3	8	38	...	....	2	3	Innumerable
12/20/33	4	10	50	5.3	0.46			
12/21/33	5	15	75					
12/22/33	7	23	142	...	....	1	1	
12/23/33	10	30	150	5.98*	0.79	1	1	8 green streptococci
12/24/33	10	30	150	5.95*	0.86			
12/25/33	10	30	150	5.99*	0.87	0	1	0
12/26/33	Discontinued			6.1	....	0	1	0
1/ 3/34	..	..	..	...	0	0	1	0

* p_H taken of twenty-four hour specimens.

TABLE 6.—*Clinical Data in Case 3, Table 4*

Date	Diet, Gm.: Carbohydrate	Protein	Fat	Urine: Diacetic Acid	B-Oxybutyric Acid	p_H	Pus, Grade	Escherichia Coli, per 0.5 Cc.
3/20/34	60	30	110	..	...	...	4	Innumerable
3/21/34	45	30	115	..	...	...	3	Innumerable
3/22/34	30	30	120	..	...	...	3	Innumerable
3/23/34	20	30	125	+	0.1	...	3	Innumerable
3/24/34	15	30	130	+	0.2	5.2	3	Innumerable
3/26/34	10	30	135	++	0.5	5.3	..	Innumerable
3/27/34	10	30	135	+	0.3	5.2	2	500
3/29/34	10	30	135	++	1.0	5.3	1	30
4/ 2/34	10	30	135	+++	1.0	5.2	1	0
4/ 3/34	Discontinued			..	...	...	..	0
4/ 5/34	..	..	...	..	...	...	0	0

In the group of five cases in which there were no stones, the concentration of beta-oxybutyric acid in the urine was always less than 0.5 per cent. In only two of these cases was the p_H of the urine 5.5 or less. This is the group in which one would not expect to obtain satisfactory results. It also is the group in which one must attempt to increase the output of beta-oxybutyric acid and attempt to lower the p_H of the urine. Whether this can be accomplished in cases in which renal func-

tion is impaired and the amount of urea in the blood is increased is a question. One patient who had a neuromuscular dysfunction of the bladder had been subjected to a presacral neurectomy. The residual urine had been reduced from 600 to 60 cc. This patient was fed beta-oxybutyric acid in capsules. The bacteria in 0.5 cc. of urine were reduced to 100. Cook [4] has shown that, in certain cases in which the p_H of the urine of an adult can be lowered, the feeding of beta-oxybutyric acid in capsules will increase its concentration in the urine to more than 0.5 per cent and will clear up an infection. In another case, a boy had a severe urinary infection with Pseudomonas, a recurring of abscesses of the liver, and cirrhosis. In this case neither the p_H of the urine nor the concentration of beta-oxybutyric acid could be brought within the bactericidal range. The administration of ammonium chloride failed to reduce the p_H of the urine, and the administration of beta-oxybutyric acid by mouth did not effect the output of this acid in the urine.

This group of cases represents rather well what can be expected of this form of dietary treatment of urinary infections. In cases in which it is possible to produce bactericidal conditions in the urine by feeding a patient the ketogenic diet either alone or with the addition of ammonium chloride and beta-oxybutyric acid, to decrease the p_H and to increase the concentration of beta-oxybutyric acid in the urine, it is possible

TABLE 7.—*Treatment of Urinary Infection with Obstruction: Sterilization of Urine with Relapse*

Case	Age, Years, and Sex	Anomalies	Urea, Mg. per 100 Cc. of Blood	Diet Continued, Days	Urine		Comment
					p_H	B-Oxybutyric Acid, per Cent	
7	12 ♀	Hydronephrosis; right megaloureter	26	9	5.5	Greater than 0.5	Salmonella infection; repeated relapses after discontinuing diet; local treatment; urine sterile since 10/11/34; nephrectomy
8	5 ♂	Right hydronephrosis; megaloureter	50	22	...	.....	Relapse after operation
9	9 ♀	Right hydronephrosis; double ureter on left side	22	6	5.0	.....	Streptococcus haemolyticus infection; recurrence; Escherichia coli infection after four months
10	1 ♀	Megaloureters	14	12	5.5	.....	Relapse after operation
11	9 ♀	Nephrolithiasis (removal of stones); residual urine	20	9	...	.....	Relapse after seven months

to clear up a considerable number of infections which are associated with urinary stasis. Stones and reduced renal function are almost absolute obstacles to successful therapy.

SUMMARY

The ketogenic diet is a useful method for treating urinary infections resistant to alkalinization, diuresis and urinary antiseptics. In cases in which urinary anomalies are associated with stasis, a temporary and often a permanent cure of the infection can be achieved in those cases in which a p_H of less than 5.5 and a concentration of 0.5 per cent beta-oxybutyric acid can be maintained in the urine for a period of time. Nephrolithiasis and impaired renal function are two serious handicaps to the success of this form of treatment.

4. Cook, E. N., and Braasch, W. F.: Further Studies on the Ketogenic Diet on Bacilluria, to be published.

TABLE 8.—*Treatment of Urinary Infection with Obstruction: Failures with Diet*

Case	Age, Years, and Sex	Anomalies	Urea, Mg. per 100 Cc. of Blood	Diet Continued, Days	Urine		Comment
					p_H	B-Oxybutyric Acid, per Cent	
12	3 ♂	Single kidney; hydronephrosis; stones	120 20	10	6.1	0.22	
13	2 ♀	Left nephrolithiasis	26	20	5.5	...	Proteus ammoniae
14	7 ♀	Bilateral nephrolithiasis	32	10 10	5.2	1.4	
15	13 ♀	Right nephrolithiasis; bilateral pyelitis	22	10	5.3	Greater than 0.5	Aerobacter aerogenes
16	6 ♀	Stones in bladder; ulcerative cystitis	18	8	8.3	1.4	Constant alkaline urine
17	9 ♂	Posterior urethral valves	70	11	5.5+	0.1	Treatment after resection of posterior urethral valves
18	5 ♂	Bilateral hydronephrosis; megaloureters	72	7 5	5.5+	Less than 0.5	Left external ureterostomy
19	2 ♂	Obstruction of vesical neck	52	6	5.5	Less than 0.5	Excision of scar tissue
20	14 ♂	Cord bladder	36	10 7	5.2	Greater than 0.5	B-oxybutyric acid, 0.5 Gm. by mouth 4 times a day; urinary culture revealed 100 colonies per 0.5 cc. of urine; presacral neurectomy
21	11 ♂	Bilateral hydronephrosis	18	14 14	5.7	Less than 0.5	Abscess of liver and cirrhosis

ABSTRACT OF DISCUSSION

DR. EDWARD L. BAUER, Philadelphia: Dr. Helmholz's presentation not only is a positive declaration of another therapeutic approach to a condition that is often most obstinate but also brings out most clearly the limitations of the treatment. He states that it is only the obstinate case in which the treatment should be tried and that the ketosis is of no value when there is obstruction to natural drainage in the urinary tract. This is particularly true when stones are present. It is important to appreciate these facts and the reasons that he has cited for recurrences and, may I add, the possibility of new infections; otherwise, resulting failure may invite an unjust adverse criticism. Emphasis should be placed on the importance of weighing out the diets and the necessity for closely watching the patient so that there will be no cheating and a consequent failure to obtain ketosis. Those of us who have tried these diets have found that it is sometimes impossible to make the child eat. Some will try and at the first sign of nausea will resist all further efforts to be fed. In a few others it just seems impossible to approach ketosis no matter how accurate the ratios may be. These handicaps should not stand in the way of utilizing this procedure in nonobstructive chronic infections of the urinary tract.

CONVALESCENT SCARLET FEVER SERUM

ITS PROPHYLACTIC AND THERAPEUTIC VALUE: A REVIEW OF 2,875 CASES

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Convalescent scarlet fever serum for both prophylactic and therapeutic purposes is an agent whose value has been well established for some years. However, its extensive use has been limited by the difficulties involved in obtaining and preparing an adequate supply. The Samuel Deutsch Serum Center has concentrated its efforts to make available a liberal quantity of pooled convalescent scarlet fever serum for the contagious disease hospitals and for private physicians in Chicago who may desire it.

Results obtained with this serum have been studied, followed and recorded. Information cards were sent to every physician who used serum in his private practice. In most instances these forms were fully answered and returned. At times the physician neglected to record all the data; but if the essential facts were set forth the card was filed for future analysis. Otherwise a letter was sent requesting the additional information. If this could not be obtained, the report was discarded. The data in respect to serum treated patients in the Municipal Contagious Disease Hospital of Chicago were secured from the hospital charts, which gave uniform and precise histories.

The present paper is an analysis of the information derived from these two sources during two and one-half years' experience. Not only were the general effects analyzed but a particular effort was made to determine whether any influence was exerted by convalescent serum therapy on complications and on mortality. These aspects of our investigation were given special attention because of the dissenting reports in the literature.

PROPHYLAXIS

Convalescent scarlet fever serum has been employed for many years in the protection of individuals exposed to scarlet fever. Its efficiency has been uniformly favorable.

Degkwitz's [1] report on passively immunizing 509 scarlet fever contacts with doses of from 5 to 6 cc. of convalescent serum for children under 8 years of age, and 10 cc. for those from 9 to 14 years, is really amazing. All but three escaped scarlet fever. Meader [2] injected 7.5 cc. of convalescent scarlet fever serum in each of 450 contacts, of whom 2.9 per cent contracted the disease, as contrasted with 321 control contacts, unprotected, of whom 12.8 per cent developed the disease. Apparently 85 per cent were protected. These two reports would be of more value if the susceptibility of the contacts had been known. The Dicks [3] in their report not only considered this factor but also determined the presence of infection. In their series of contacts they made both skin tests and throat cultures. Those who were Dick positive but had cultures negative for hemolytic streptococci were actively immunized. On the other hand, the ones who had both positive skin tests and positive throat cultures for hemolytic streptococci were passively immunized with convalescent scarlet fever serum. Fifty per cent of the latter group already had sore throat and fever at the time convalescent serum was injected. In none, however, did scarlet fever develop. This was a most rigorous and critical test of the value of convalescent serum for passive immunization.

Gordon [4] at the Herman Kiefer Hospital passively immunized student nurses who, when reporting for training, were found to be Dick positive. In a group of 112 such nurses who received 15 cc. of human scarlet fever convalescent serum, 92 per cent were protected; eight who contracted scarlet fever had very mild attacks.

Because of these reports, 7.5 cc. of serum was employed for prophylaxis at the beginning of this study, but within a year the dose was increased, so that 10 cc. was used for children under 10 years of age and 20 cc. for those over this age. The serum was given chiefly to intimate home contacts who had no history of having had scarlet fever.

TABLE 1.—*Scarlet Fever Prophylaxis in 862 Home Contacts Giving No History of Scarlet Fever*

Age, Years	Number of Cases	No Scarlet Fever	Mild or Modified Scarlet Fever Incubation Period	Unmodified Scarlet Fever Incubation Period	Per Cent No Scarlet Fever
½ to 5	308	304	4 (2 not known; 1 5 days; 1 11 days)	0	98.7
5 to 10	229	219	7 (5 not known; 1 4 days; 1 8 days)	3 (1 not known; 1 4 days; 1 11 days)	95.6
10+	276	269	3 (1 5 days; 1 6 days; 1 11 days)	4 (2 not known; 1 10 days; 1 15 days)	97.5
?	49	46	1 not known	2 (1 not known; 1 10 days)	93.9
Total	862	838	15 (8 not known; 4 immediate; 3 delayed)	9 (4 not known; 1 immediate; 4 delayed)	97.2

Nine patients developed scarlet fever from three to five weeks later.
Sixteen patients developed acute pharyngitis or tonsillitis.
Five patients developed cervical adenitis or otitis media.

Reports susceptible of analysis were received on 862 such prophylactic inoculations. Eighty per cent of the contacts were immunized within the first three days after exposure, about 10 per cent after three days, and in 10 per cent the duration of exposure was not recorded. The exact figures are shown in table 1. Scarlet fever developed in twenty-four contacts. In twelve the incubation period was not recorded; in seven it was markedly delayed, and in five the usual incubation period preceded the illness. Additional reports were made on nine other patients who escaped the disease following serum administration but contracted scarlet fever from three to five weeks later following a reexposure, without serum protection being repeated.

It is interesting to note that in sixteen patients acute pharyngitis or tonsillitis developed after exposure to scarlet fever following serum injection, and five had cervical adenitis or otitis media. However, there was no rash and the cases were not considered scarlet fever.

Serum was administered to children in general hospital wards when exposed to active cases of scarlet

From Muncipal Contagious Disease Hospital, Board of Health, and Samuel Deutsch Serum Center, Michael Reese Hospital.

1. Degkwitz, R.: Causative Agent in Scarlet Fever, München. med. Wchnschr. **69**: 955-957 (June 30) 1922.
2. Meader, F. M.: Scarlet Fever Prophylaxis, J. A. M. A. **94**: 622-625 (March 1) 1930.
3. Dick, G. H., and Dick, Gladys F.: Prevention of Scarlet Fever, J. A. M. A. **83**: 84-86 (July 12) 1924.
4. Gordon, J. E.: Monthly Hospital Reports, Herman Kiefer Hospital, Detroit, June 1934.

fever developing in the wards. These contacts were Dick tested, and only Dick-positive patients received convalescent serum. Of eighty-three patients immunized, scarlet fever developed in four after a prolonged incubation period (table 2). In all four cases the disease was mild and atypical. The throat cultures were positive for hemolytic streptococci.

Among those in whom mild scarlet fever appeared, the majority had a definitely modified type of the disease. This form of scarlet fever was characterized by

TABLE 2.—*Scarlet Fever Prophylaxis in Eighty-Three Dick Positive Cases in Hospital Exposed to Scarlet Fever*

Day of Exposure Before Injection	Number of Cases	No Scarlet Fever	Mild or Modified Scarlet Fever Incubation Period	Per Cent No Scarlet Fever
1	48	47	1 7 days	98
2	16	15	1 7 days	94
3	5	5	0	100
4	14	12	2 {1 7 days {1 10 days	86
Total	83	79	4	95

a transient evanescent rash, by a rise of temperature of only one or two degrees, and by the absence of angina and toxemia. Without a history of susceptibility and exposure, they might very easily have been overlooked. They were analogous to the sero-attenuated measles so frequently seen following exposure to measles and delayed administration of convalescent measles serum.

So-called mild or atypical scarlet fever is not of infrequent occurrence. Such types of the disease may be seen in other members of a family or group in which a case of severe scarlet fever exists. The atypical form is presumed to occur in those individuals who possess a partial natural immunity to the disease. Similarly, modified sero-attenuated scarlet fever is sometimes seen in individuals who have been artificially but incompletely immunized with convalescent serum or when the individual has been exposed to scarlet fever late in the period of passive immunization; i. e., after the tenth to the fourteenth day. The modified disease is of the same character as the "atypical" mild disease that develops in the presence of a partial natural immunity.

When immediate protection is secured by serum injection, passive immunity has been induced, and this can be relied on to endure for only ten to fourteen days. Therefore, with prolonged exposure of susceptible individuals, repeated injections at ten-day intervals are advisable until the source of possible infection has been removed. Since there is no sensitization produced by human serum, repeated inoculations may be given without fear of serious reactions or development of unpleasant consequences.

THERAPY

The consensus [5] in the literature is that the pooled convalescent scarlet fever serum has a beneficial influence on the early toxemia, angina, temperature and rash of scarlet fever, although different views are held as to the degree of such beneficial action. However, there is a pronounced divergence of opinion on the value of convalescent serum in preventing or alleviating the complications associated with this disease, and necessarily on the mortality. Thus, Toomey [6] believes that the effect of serum is antitoxic only and that one cannot expect any therapeutic effect in the complicated cases. Birkhaug,[7] admitting a rapid diminution in the toxic manifestations, finds no influence on the septic complications. Ciuca, Craciunescu and Bahov,[8] although considering convalescent serum an indispensable measure in toxic forms of scarlet fever, believe that it has no direct action on the angina or on the complications. Bode [9] likewise could not ascertain any effect on complications. Opposing these conclusions, however, are others that a favorable influence is observed on complications by administration of convalescent serum. Kling and Widfeldt,[10] although acknowledging a less noticeable effect on complications than on the mortality or severity of the illness, state nevertheless that improvement in complications was observed. Gordon, Bernbaum and Sheffield,[5] in their analysis of 120 severely sick scarlet fever patients treated with convalescent serum, believed that complications were less frequent.

Bahov,[11] in a study of 1,000 scarlet fever cases, stated that pooled convalescent serum is the ideal form of therapy and that, when given, it prevents streptococcic complications. Prinzing,[12] in a comparison of ninety-seven serum treated and 257 untreated cases, found the results given in table 3. His conclusions were that the injection of serum reduced markedly the incidence of complications in those cases which he had analyzed.

Information for our study was obtained from 983 reports sent in by private physicians and from observations of 947 patients in the Municipal Contagious Disease Hospital.

Before the data are discussed, it is necessary to consider certain essential conditions. During the period (1932-1934) in which serum was employed, the clinical type of scarlet fever in the city of Chicago was at least of the same average severity as it had been for several years previously. Because the supply of convalescent

TABLE 3.—*Prinzing's Comparison in Treated and Untreated Cases*

	No Serum, per Cent	With Serum, per Cent
Lymphadenitis	38.5	15.5
Otitis media	19.8	9.3
Glomerulonephritis	19.1	8.2

serum was limited, its use was restricted, as far as possible, to severely sick patients. Although early and prompt treatment was urged, this frequently was not done, so that many patients did not receive serum for a week or more after the onset of their illness. Serum was never withheld from a patient even though he was moribund when first seen. Too often septic complica-

5. Gordon, J. E.; Bernbaum, B. B., and Sheffield, L. C.: Convalescent and Antitoxic Serums in Scarlet Fever, J. A. M. A. **90:** 1604-1607 (May 19) 1928. Moog, O.: Zur Theorie der Proteinkorperwirkung nach Beobachtungen bei der Serumbehandlung des Scharlachs, Berlin. klin. Wchnschr. **58:** 388, 1921. Bie, V.; Larsen, A., and Anderson, S.: Etiology and Serotherapy of Scarlatina, Ugesk. f. læger **89:** 981 (Oct. 27), 1001 (Nov. 3) 1927. Klieneberger: Kritisches Sammelreferat über Behandlung des Scharlachfiebers, Deutsche med. Wchnschr. **48:** 1680 (Dec. 15) 1922. Weaver, G. H.: Scarlet Fever Treated with Immune Human Serum, J. Infect. Dis. **22:** 211-219 (March) 1918.

6. Toomey, J. A.: Treatment and Prevention of Scarlet Fever by Specific Antitoxin and Serums, J. A. M. A. **91:** 1599-1602 (Nov. 24) 1928.

7. Birkhaug, K. E.: Studies in Scarlet Fever, Bull. Johns Hopkins Hosp. **36:** 134 (Feb.) 1925.

8. Ciuca, M.; Craciunescu, V., and Bahov, I.: Contribution au traitement de la scarlatine per le serum de convalescent, Compt. rend. Soc. de biol. **98:** 395-397 (Feb. 10) 1928.

9. Bode, P.: Die Behandlung des Scharlachs mit Rekonvaleszentenserum, Jahrb. f. Kinderh. **119:** 29-69 (Feb.) 1928.

10. Kling, C., and Widfeldt, G.: Serotherapy of Scarlet Fever, Hygiea **80:** 2 (Jan. 16) 1918.

11. Bahov, J.: Contribution à l'étude de la scarlatine, Arch. de méd. d. enf. **33:** 327-346 (June) 1930.

12. Prinzing, F.: Bemerkungen über Komplikationen und Nachkrankheiten des Scharlachs bei Serotherapie, Therap. Monatsch. **32:** 16-18, 1918.

tions of a hopeless nature were present, but even in the face of a fatal termination serum was used.

The hospital group and private group showed two important differences. Owing to delay in hospitalization of patients, only 42 per cent received treatment in the first three days of their illness, whereas in the home group 79 per cent were treated during this period. Secondly, it was possible to maintain more rigid control of serum administration in the hospital, and consequently serum was employed only for critically sick patients. Such restriction could not be enforced for those patients treated in the home; therefore this group was made up of 33 per cent severe, 47 per cent moderately severe and 20 per cent mild cases. It must be kept in mind that any difference in the results obtained with scarlet fever therapy should definitely favor the home-treated patients.

Other factors that must be considered in analyzing these two groups are the dosage of serum and the route of administration. In the group treated at the contagious disease hospital the dose varied from 20 to 100 cc., the average dose being approximately 30 cc. In those treated at home the dose administered also varied from 20 to 100 cc.; but more serum was used in the individual cases, so that the average dose was 40 cc. On the other hand, the route of administration in the home-treated group was almost invariably intramuscular, whereas in the hospital-treated cases a great many received the serum intravenously. This was particularly true during the last year (1934), when the favorable outcome obtained by this method of administration was much more impressive.

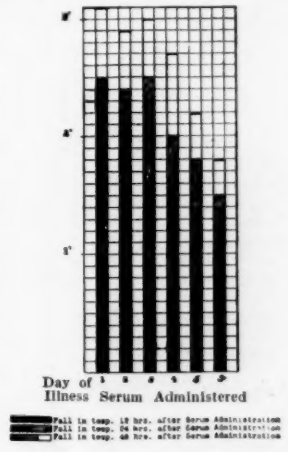
Efficiency of treatment can be analyzed from two different angles: first, from the clinical impression of the effect of serum therapy on the general condition, toxemia, angina and rash; second, from the statistical evidence of the effect of serum on temperature, complications and fatality.

The therapeutic effects of the serum as observed by various physicians in the treatment of private patients were good in 81 per cent, fair in 8 per cent, and questionable or of no benefit in the others (11 per cent). In the hospital, good results were recorded in 75 per cent of the cases, fair results in 11 per cent, and questionable or no effect in the remaining 14 per cent. The most notable and immediate influence of the serum was on toxemia, which in most cases was markedly diminished. In the majority of cases there was also a prompt improvement in the anginal symptoms. The effect on the eruption was less evident but, as has been previously reported, it was most apparent when the serum was given within the first twenty-four hours of the disease. Serum administered at this time very often produced a rapid and complete disappearance of the rash. The desquamation in the latter cases was usually of a very fine branny nature or absent entirely. When serum was given later in the course of the illness after the rash had been present for two or more days, the general blanching effect was less pronounced.

No statistical analysis could be made regarding the effects of serum on temperature in the home-treated cases, but reports from physicians were uniform in stating a marked temperature drop in from twelve to forty-eight hours following injection of the serum. The occasional exception was observed only in those patients who were suffering from severe complications at the time serum was administered. The hospital records provide more precise information concerning temperature. A study of the charts of 947 hospital patients disclosed an average drop in temperature at the end of twelve hours of 1.7 degrees, at the end of twenty-four hours of 2 degrees, and at the end of forty-eight hours of 2.6 degrees. In many instances there were dramatic reductions of 4 and 5 degrees within a few hours, but patients suffering from septic complications seldom responded in such an amazing manner.

The accompanying chart summarizes the reduction in temperature according to the day of illness on which serum was administered and brings out the interesting fact that those patients treated in the first three days of their illness had the greatest average reduction in temperature. The later the serum was administered, the less pronounced was its effect. On and after the fifth day of illness the average drop in temperature at the end of forty-eight hours was not as great as at the end of twelve hours when the serum was given within the first three days.

Because the serum was prescribed as a therapeutic agent and not in an experimental fashion, not only was it given to every critically sick patient admitted to the hospital or reported to the Serum Center, but it was not denied to patients late in the course of the disease who were suffering from some apparently fatal complication. Owing to this policy, a similar control group was not secured.



Average decrease in temperature following administration of serum in 909 severely sick hospital patients.

In order to arrive at some decision as to the value of convalescent serum therapy in preventing or alleviating complications, the results recorded in the serum-treated groups are compared with the other admissions to the Municipal Contagious Disease Hospital during the same period. The latter group was made up of 6,282 patients who were but mildly or moderately ill when hospitalized.

Thus there are three different groups for consideration: The first and most severe group is made up of the hospital-treated patients; the second group in order of severity is the home-treated group, and the third, or least severe group, comprises those patients only mildly or moderately sick on admission to the hospital and not treated with serum (table 4).

Owing to the fact that about 53 per cent of the first group had complications on admission, these complications were recorded under the caption Before Serum, since they were present before serum was administered. Because of this, the chances for the development of further complications were considered to be materially increased.

This has been the general experience with other types of therapy, but it was found that such progression did not usually take place after administration of convalescent scarlet fever serum. On comparing the incidence of complications in group 1 with those of group 3, it is seen that with two exceptions complications in the milder group (3) not given convalescent serum were more numerous than in the group (1) severely ill but treated with convalescent serum. Only

mastoiditis, with 0.7 per cent, and "other complications," which includes the less frequent and more serious conditions such as pneumonia and streptococcic meningitis, with 0.9 per cent, were more common in group 1. Particular attention must be called to the infrequent occurrence of hemorrhagic nephritis in group 1, 0.6 per cent as compared with 3.6 per cent in group 3.

It is extremely difficult to draw any comparison between groups 1 and 3 on account of the frequency of complications in group 1 at the time of admission to the hospital. More accurate evaluation of the effect of convalescent serum might be made if the two groups were more nearly alike. Because the preexistence of complications provides such a disturbing factor, the patients in group 1 free from complications at the time of serum administration were placed in a separate subgroup, designated After Serum in the table. Of the fewer than in the other two groups. The number and percentage of the complication hemorrhagic nephritis occurs in group 2 in only 0.2 per cent of the patients as compared with 0.6 per cent in the severely ill patients in group 1, and as against 3.6 per cent in group 3, consisting of the moderately and mildly ill patients who did not receive convalescent serum.

Analysis of the mortality in the serum-treated hospital patients presents a complex problem. The difficulty of analysis is caused by the policy of treating all critically ill patients. As a result, it was to be expected that the mortality would be very high. Many patients succumbing to scarlet fever or its complications were rushed to the hospital at the last moment in a moribund state and yet were given serum. Thus, most of the patients dying in the hospital received serum. Seventy per cent of these deaths occurred in patients who were not treated until after the fifth day of illness, and there

TABLE 4.—*Complications in Patients Treated with Convalescent Serum*

Condition*		Complications in 947 Severe or Critical Hospital Patients Treated with Convalescent Serum: 1st Day 33 Cases	2d Day 139 Cases	3d Day 230 Cases	4th Day 200 Cases	5th Day 135 Cases	5+ Days 210 Cases	Total 947 Cases	Per Cent	Complications in 983 Home Patients Treated with Convalescent Serum 33% Severe, 47% Moderately Severe, 20% Mild: 1st Day 313 Cases	2d Day 315 Cases	3d Day 145 Cases	4th Day 49 Cases	5th Day 22 Cases	5+ Days 58 Cases	? Days 81 Cases	Total 983 Cases	Per Cent	Percentage of Complications in 6,292 Remaining Hospital Patients Not Treated with Serum with Mild or Moderately Severe Scarlet Fever
Cervical adenitis	AS	3	14	24	10	10	8	69	10.6	25	28	16	4	4	7	7	91	9.5	27
	BS	3	29	60	47	54	104	297	31.4	4	2	4	3	4	9	1	27	2.7	
Purulent rhinitis	AS	1	3	8	5	3	1	21	2.8	1	3	0	0	0	1	0	5	0.5	8.7
	BS	2	14	38	34	36	76	200	21.1	0	0	0	0	0	0	0	0	0.0	
Suppurative otitis media	AS	2	12	20	27	17	34	112	12.7	29	25	10	4	4	5	7	84	8.8	13.6
	BS	0	4	6	11	7	37	65	6.9	4	3	6	4	3	8	1	29	3.0	
Simple otitis media	AS	0	0	0	0	0	0	0	0.0	2	5	2	0	0	0	0	9	0.9	
	BS	1	3	11	5	1	4	25	2.6	4	0	0	1	0	0	0	5	0.5	
Suppurative sinusitis	AS	0	0	1	4	0	0	5	0.6	3	0	1	1	0	2	0	7	0.7	1.5
	BS	0	3	2	11	12	22	50	5.3	1	0	0	1	1	0	0	3	0.3	
Mastoiditis	AS	0	1	6	7	6	14	34	3.6	2	2	1	0	1	1	1	8	0.8	2.9
	BS	0	1	2	1	2	7	13	1.4	2	1	1	0	0	0	0	4	0.4	
Arthritis	AS	3	3	4	3	5	2	20	2.1	3	0	1	0	0	0	1	5	0.5	2.6
	BS	0	0	0	0	0	1	1	0.0	0	0	0	0	0	1	0	1	0.1	
Hemorrhagic nephritis	AS	0	0	2	1	1	2	6	0.6	1	0	1	0	0	0	0	2	0.2	3.6
	BS	0	0	1	1	0	1	3	0.3	0	0	0	1	0	2	1	4	0.4	
Mild nephritis	AS	2	0	2	2	0	0	6	0.6	1	2	1	0	0	0	0	4	0.4	
	BS	1	0	2	1	1	1	6	0.6	1	0	0	0	1	0	0	2	0.2	
Other complications	AS	0	2	6	4	6	14	32	3.7	4	3	6	1	0	1	1	16	1.7	2.8
	BS	3	3	11	7	13	56	93	9.8	3	3	1	2	3	9	2	23	2.3	
Deaths		1	5	10	11	11	71	109	11.5	2	1	2	3	2	7	0	17	1.7	
Deaths, per cent		3	3.6	4.4	5.5	8.1	34	11.5		0.6	0.3	1.4	6.1	9.1	12.1	0	1.7		0.8

* AS indicates complications developing after serum administration; BS, complications present before serum administration. The percentage of complications in the AS group was calculated after the number of patients in the BS group was deducted from the total number of patients.

947 serum patients treated in the hospital, 446 had no complications at the time they were admitted. Of these 446 patients, no complications developed in 79 per cent. The complications that did appear in this group were decidedly fewer than in group 3, in which serum therapy was not given (table 5). The greatest significance must be attached to the figures shown in table 5, for the patients in group 1 were clinically classed as severely or critically sick, a group in which a much higher incidence of complications may be expected than in the milder types of scarlet fever.

Group 2, the home-treated patients, contains severe, moderate and mild cases and occupies a midway position between groups 1 and 3. In the reports submitted by physicians, there were many instances in which it was not clear whether the complications recorded were present at the time serum was given or developed after serum administration. In all instances in which there was doubt, such complications were recorded for this report as having developed after the administration of serum, making a more severe test of the value of serum. In this group, all complications are much

was a steady increase in the fatality rate with the prolonged duration of illness before serum was given. To appreciate better the type of patient that was treated, the clinical condition at the time of serum administration and the course subsequent to serum injection, the deaths of hospital patients treated in the first five days of their illness are recorded in table 6. The remaining fatalities occurred in patients who received serum later than the fifth day of their illness. This group was made up entirely of individuals even more critically ill and with one or more severe complications.

On the other hand, it is interesting to examine the mortality figures in the home-treated group, a group that was treated mostly in the first few days of the disease. Here it is seen that the total mortality was only 1.7 per cent, although the majority of patients who died received serum after the third day of illness. Table 7 summarizes all the deaths in the home-treated patients. A study of these tables will show that in nearly all instances the patients who died were either moribund or were suffering from some complication that made the prognosis very grave before serum

administration. The figure on mortality that is highly significant is the fatality rate of the private patients treated in the first three days. This rate in 773 patients is but 0.5 per cent, approximately one-third the fatality rate of this disease throughout the city at the same time.

In our experience, no sensitization to convalescent serum is developed nor are any unfavorable reactions produced. An occasional urticaria-like eruption has been witnessed, but no definite picture of a true serum sickness has occurred. Despite extensive administration of large doses of serum by the intravenous route, no shock or unpleasant reaction was produced among the cases reviewed in this paper. No blood typing or matching is required in the administration of human convalescent serum.

The following regulations should be adhered to in this form of therapy:

1. The serum should be given early in the course of the disease, preferably within the first three days of illness.
2. Adequate dosage is of the utmost importance. Although a minimum dose of 20 cc. may be sufficient, from 40 to 100 cc. may be required. Age of the patient, severity of the illness, duration of the disease and experience with this form of treatment will determine the proper dosage. Usually a single injection of the proper amount of serum is sufficient in the uncomplicated case. At times, when severe complications are present, repeated injections of serum at intervals of twelve or twenty-four hours may be necessary.
3. Although intramuscular therapy is satisfactory, the intravenous route is preferable, because of the immediate distribution of serum. For intravenous use the following precautions should be observed: (*a*) The serum should be warmed to body temperature in a warm water bath and injected slowly; (*b*) the syringes used for injection must be chemically clean, having been sterilized in distilled water.

COMMENT

On the basis of the evidence that human convalescent scarlet fever serum is valuable for passive immunization, the following measures may be applied in the hospital or in the home.

In a contagious disease hospital, where patients with a variety of infectious diseases are admitted, occasionally and unavoidably a patient who is not suffering from scarlet fever may be exposed to this infection. Under such circumstances an intramuscular injection of 10 cc. of convalescent scarlet fever serum is usually sufficient for immediate protection. The immunity, however, lasts only from ten days to two weeks. This must be kept in mind, and subsequent injections of convalescent serum should be given at ten-day intervals if exposure to scarlet fever continues.

In the home the protection by passive immunization with convalescent scarlet fever serum is equally valuable. This is particularly true when there are a number of children in the family and the ill child remains at home. If all contacts could be immediately immunized, the number of multiple cases in a family would be materially reduced. For example, among scarlet fever patients admitted to the Municipal Contagious Disease Hospital of Chicago in 1932, there were in the families of these patients 488 multiple cases. In 1933 there were 761 multiple cases, and in the first six months of 1934 there were 522 multiple cases. These cases occurred in 210, 311 and 209 families respectively for the periods stated. These totals mean that there were 730 families in which scarlet fever was transmitted from the primary cases to contacts in the home on an average of 1.4 times, or a total of 1,041 cases that might have been prevented by prompt use of convalescent serum when the first case in the family developed.

In the presence of a severe epidemic, exposed susceptible children should be passively immunized at intervals of every ten days, provided an adequate supply of serum is available. Thus the use of convalescent serum might be applied to check an unusual outbreak of scarlet fever.

In 1916 one of us (Hoyne) recommended the adoption of convalescent scarlet fever serum for the treatment of scarlet fever at the Municipal Contagious Disease Hospital of Chicago. Although used in small quantities in isolated cases during the ensuing years, it was only when the facilities of the Serum Center made available a substantial supply of serum that its extensive use became possible.

Our results confirm the numerous reports of the beneficial therapeutic action of convalescent serum. Particularly when administered in the first three days, it effects a marked diminution of temperature, alleviation of throat symptoms, toxicity and prostration, and may cause a fading of the eruption. The evidence we have compiled points strongly to a marked reduction in the incidence of complications as well as lowering of the mortality rate.

TABLE 5.—*Incidence of Complications in Hospital Patients Critically Ill but Free from Complications at the Time of Serum Administration*

Day of Illness	Number of Cases	No Complications	Cervical Adenitis	Suppurative Otitis Media	Rhinitis	Arthritis	Mastoiditis	Nephritis
1	24	18	3	1	0	2	0	0
2	95	77	13	5	4	2	0	0
3	129	99	15	8	6	3	1	1
4	111	91	8	6	5	2	0	1
5	57	43	9	3	3	4	1	0
6	19	17	2	0	1	0	0	0
7	6	5	1	0	0	0	0	0
8	5	4	0	1	0	0	0	0
Total	446	354	51	24	19	13	2	2
Per cent	100	79	11	5	4	3	0.5	0.5
Percentage of complications in untreated mild and moderately ill patients	6,282		27	13.6	8.7	2.6	2.9	3.6

There is no statistical method of evaluating the effect of serum on existing complications. Close observation of several hundred complicated cases, in which the patients were desperately ill on admission and were treated with serum, has convinced us that the majority of these patients have been definitely benefited by such treatment. Our experience with this disease enables us to judge these cases fairly accurately. Many patients with a septic process that we felt would advance have shown such definite improvement, with cessation of the progress of the disease, that we are forced to conclude that the serum played an active part in overcoming infection. When the complicated cases are admitted in the late stages of the illness, we have supplemented convalescent serum with intramuscular injections of whole blood or with transfusions from individuals recently recovered from scarlet fever, with increasingly better results.

With the limited knowledge of this disease, the mode of action of the serum in reducing complications and mortality is, at the present time, problematic. It is possible that the beneficial effect is produced in an indirect manner by overcoming the toxemia and thereby

TABLE 6.—*Analysis of Those Deaths (Thirty-Eight) in the Hospital Group (737) Treated Within Five Days of Illness with Convalescent Serum*

Age	Sex	Day of Illness Serum Administered	Number Cc.	Condition on Serum Administration	Course	Time of Death After Serum Was Administered
5	♂	4	20	Moribund	No change	4 days
1	♀	4	10	Right bronchopneumonia	Progression and spread of pneumonia	64 hours
3	♂	4	20	Severe cervical adenitis with cervical cellulitis	Slight temporary improvement, then relapse	8 days
37	♂	3	40	Acute hemorrhagic nephritis, septicemia with septic arthritis	No change	20 hours
4	♂	4	20	Streptococcic peritonitis	No change	7 hours
4	♂	5	40	Severe cervical adenitis with cervical cellulitis	Slight temporary improvement, then progression to face and scalp	4 days
3	♂	3	40	Septic	Progressed	3 days
23	♂	3	40	Streptococcic pneumonia	Progressed	3 days
5	♂	3	20	Bronchopneumonia	Progressed	4 days
66	♂	5	40	Pneumonia plus purulent pericarditis, moribund	No change	2 hours
4	♂	2	20	Septic	Purulent otitis media, on tenth day terminal pneumonia	11 days
3	♂	5	40	Purulent sinusitis, purulent otitis media, cervical adenitis, bronchopneumonia	No change	18 hours
3	♀	3	40	Streptococcic laryngitis, necessitating intubation	Progression	1 day
1	♀	3	20	Cervical adenitis	Developed rhinitis, purulent otitis media, bronchopneumonia terminally	18 days
11	♀	1	10	Moribund	Condition terminal, died before more serum could be administered	No hours
2	♂	4	80	Septic	Temporary improvement, then progression	3 days
27	♀	5	20	Surgical scarlet fever following abortion; septicemia with peritonitis	No change	4 days
7	♀	5	40	Cervical adenitis with septicemia	No change	20 hours
6	♀	2	40	Purulent rhinitis, cervical adenitis, septicemia	Temporary improvement, then progression	60 hours
38	♂	5	100	Acute cardiac failure, acute pulmonary congestion	Progression	12 hours
7	♀	4	40	Purulent rhinitis, septic	Temporary improvement, then developed cervical adenitis, on seventh day purulent otitis media, on eleventh day cervical abscesses, final cardiac failure	21 days
2	♀	4	20	Purulent rhinitis, purulent otitis media	Pneumonia 2 days later, which progressed	7 days
4	♂	5	40	Purulent rhinitis, cervical adenitis	No change	36 hours
17	♂	4	40	Moribund	No change	2 hours
5	♂	3	20	Purulent rhinitis, cervical cellulitis, purulent otitis media, moribund	No change	4 hours
1	♀	2	40	Purulent rhinitis, purulent conjunctivitis, bronchopneumonia	No change	1 day
5	♂	3	40	Purulent rhinitis, cervical adenitis	Slight temporary improvement, developed purulent otitis media and bronchopneumonia terminally	9 days
19	♂	4	100	Lobar pneumonia	Transient improvement	84 hours
5	♀	3	40	Cervical adenitis, purulent otitis media	Terminal	6 hours
16	♀	4	40	Severe cervical cellulitis, 7 months pregnant	Dead fetus delivered 5 days later, placenta adherent; died 8 hours after delivery	5 days
12	♀	2	60	Moribund	No change	5 hours
4	♂	4	10	Moribund	No change	3 hours
5	♀	5	20	Septic	Temporary improvement, developed purulent otitis media, mastoiditis, streptococcic meningitis	39 days
3	♀	2	20	Cervical adenitis, purulent otitis media	Definite improvement to convalescence, developed bilateral bronchopneumonia 2 weeks later	17 days
1	♂	3	20	Cervical cellulitis	No change; cardiac failure	2 days
4	♂	5	40	Cervical cellulitis with suppurative sinusitis	Progressed	48 hours
10	♂	5	40	Cervical adenitis, rhinitis, left purulent otitis media and left mastoiditis	Progressed	1 day
6	♀	5	60	Cervical adenitis, cardiac failure	No change	1 day

TABLE 7.—*Analysis of All Deaths (Seventeen) in the Home Treated Group (983)*

Age	Day of Illness Serum Administered	Number Cc.	Condition on Serum Administration	Course	Time of Death After Serum Was Administered
6	10	40	Streptococcic meningitis	Rapid progression	?
3	7	40	Cervical adenitis, bronchopneumonia	Slight temporary improvement	4 days
5	2	40	Streptococcic meningitis	Rapid progression	?
2	4	20	Cervical adenitis, cervical cellulitis, purulent otitis media, hemorrhagic nephritis	Progression	4 days
7	21	60	Moribund	No change	2 days
6	5	60	Cervical adenitis, cervical cellulitis, septic	Progression	2 days
9	7	60	Purulent otitis media plus streptococcic meningitis	Progression	?
3	1	20	?	?	7 days
4	3	60	Streptococcic pneumonia	Progression	7 days
2	4	40	Moribund	No change	24 hours
6	12	60	Anuria, comatose	Progression	24 hours
5	3	20	Cervical adenitis	Developed purulent otitis media and cervical cellulitis	18 days
6	1	40	Surgical scarlet fever with peritonitis following appendectomy	Progression	?
10	4	20	Cervical adenitis, purulent otitis media, purulent sinusitis	Temporary improvement, developed cavernous sinus thrombosis	13 days
7	9	80	Purulent otitis media, endocarditis	Progression	4 days
15	13	20	Septicemia	Progression	?
9	5	40	Cervical adenitis, cervical cellulitis with necrosis; moribund	No change	8 hours

permitting the depressed, general body defenses to act against those factors of the disease which are associated with the complications. On the other hand, convalescent serum may contain other substances, indeterminable by present laboratory procedure, which act directly in preventing or alleviating complications.

Not only are scarlet fever complications a matter of importance as a factor in mortality or in late disability in the life of the patient but they also have a direct bearing on the cost of caring for the patient. In many instances, too, when scarlet fever patients remain in hospitals for prolonged periods, they reduce the number of available beds for acute cases that are in urgent need of hospital care. Therefore, any remedy that reduces the time of hospitalization promotes economy on a per capita basis and increases capacity through allowing hospital treatment of a greater number of patients within a given time.

It is generally acknowledged that scarlet fever morbidity and mortality fluctuate from time to time, and changes in virulence may be noted. One of us has been in a position to observe carefully the trend of this disease over many years. As has been stated, we feel that during the last three years (1932 to 1934 inclusive) the clinical disease has been at least as severe as during the preceding three-year period (1929 to 1931 inclusive). A comparison of the fatality rates of these two three-year periods may therefore be of interest, for in the last three years convalescent serum was used extensively both in the hospital and throughout Chicago.

The city records for 1929-1931 reveal 25,743 cases with 547 deaths, a case fatality rate of 2.13 per cent. The records for 1932-1934 show 26,611 cases with 419 deaths, a case fatality rate of 1.5 per cent. Similarly, the records of the Municipal Contagious Disease Hospital show for the years 1929-1931 without convalescent serum treatment 6,353 cases with 156 deaths, a case fatality rate of 2.46 per cent, as contrasted with the convalescent serum treatment years of 1932-1934, when there were 8,457 cases with 157 deaths, or a case fatality rate of 1.86 per cent. It is seen that the mortality throughout the city was lessened by 0.63 per cent and in the hospital by 0.60 per cent, an actual decrease of 29.6 and 24.4 per cent respectively. The explanation of the considerable reduction in the mortality rate may be attributed to the fact that, although convalescent serum was administered to only from 7 to 8 per cent of the total number of patients in the city, the group thus treated was made up chiefly of the severely sick or critically ill individuals. It is essentially this type of the disease that causes the greatest number of fatalities. Since the home-treated group showed a mortality rate of only 0.5 per cent in those patients treated in the first seventy-two hours of illness, a further reduction in fatality may be expected with more widespread, proper and early use of convalescent serum.

SUMMARY

1. Of 862 home contacts who gave no history of scarlet fever and were passively immunized with convalescent scarlet fever serum, scarlet fever did not develop in 97.2 per cent.

2. Of eighty-three Dick-positive hospital contacts immunized with convalescent scarlet fever serum, scarlet fever did not develop in 95 per cent.

3. In immunized contacts in whom scarlet fever developed, it was usually in a modified form, believed to have been produced by partial immunization and resultant sero-attenuation.

4. Convalescent scarlet fever serum in adequate therapeutic doses administered early may abort the disease and usually causes recession of fever, diminution of toxemia and angina, and fading of the rash and appreciably shortens the period of illness.

5. Convalescent scarlet fever serum, directly or indirectly, either prevented the development of complications or reduced the frequency of their occurrence.

6. The influence of serum on late and complicated cases was less marked but frequently seemed beneficial.

7. By reducing the severity of the disease and the incidence of complications, the mortality rate was definitely diminished.

8. No unfavorable reactions, serum sickness, sensitization or anaphylactic shock were encountered with the use of human convalescent scarlet fever serum.

BUFFERED LACTIC ACID EVAPORATED MILK IN INFANT FEEDING

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Since the introduction of chemically acidified milk by Marriott,[1] numerous suggestions and modifications have been made regarding its use, but evaporated milk acidified with lactic acid has stood the test of repeated trials. There is still some skepticism, however, regarding the rôle of the acid. Marriott considered acid milk valuable because of further alteration of the milk curd and improved gastric digestion when the buffer salts of the milk are neutralized by acidification. Brennemann [2] reported his gradual adoption of Marriott's formula for acid milk after a clinical trial in the Children's Memorial Hospital in Chicago and his conclusion was: "The result was all that has been claimed and all that could be hoped for, and again such as I had never seen before with any other food." As to the theoretical rôle of the acid, he believed that the effectiveness of the formula was due to the finer curd and not to the buffer, which might be increased or reduced without changing the value of the formula if the finer curd was obtained.

Schloss [3] concurred with Brennemann's statement though he stressed the benefit of the altered curd from an allergic point of view. It has also been shown [4] that acidified milk increases gastric motility, which in turn improves all gastric functions, including gastric secretion. There is also an increased absorption of fats, proteins and mineral matter with this type of feeding.[5]

At the St. Louis Children's Hospital Clinic it was recently shown [6] that, when gastric acidity is lowered, the acid formula will also prevent the growth of organisms in the upper portion of the intestinal tract. The relationship of infection of the middle ear to B. coli was demonstrated by obtaining cultures of this

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organism from the gastric contents. The seeding of this organism in the upper portion of the respiratory tract is due to vomiting. A buffered acid mixture was devised to counteract the growth of B. coli, and it aided in maintaining a more normal gastric p_H and prevented the colon bacillus from entering the gastric zone.

Arnold's [7] experimental work at the University of Illinois College of Medicine substantiated the clinical observations of the St. Louis group of investigators. He showed a definite mechanism by which the upper portion of the intestinal tract is kept free from the flora of the lower portion, which is largely a matter of acidity in the upper portion. It was found that this protection failed when counteracted by alkalis, and the colon bacillus could then grow in the stomach. There was sufficient permeability to allow these organisms to migrate through the intestinal wall, and cultures were obtained from the thoracic duct. It would seem that in conditions associated with a reduction of the gastric p_H benefit would be derived from acid feedings buffered to maintain a better acidity than is contained in the usual lactic acid formula. An interesting corollary was provided in the study of autonomic balance in various body functions by Petersen [8] and his co-workers and by Müller [9] with his theory of splanchnoperipheral equilibrium. They showed that an increased functional activity of the skin is accompanied by peripheral leukocytosis, an inhibition of function and leukopenia of the splanchnic organs.

Clinically, a high external temperature or fever in the case of an extremely weak or premature infant is accompanied by a lowered gastric acidity and, hence, an acid formula is indicated in such cases.

We have used the buffered acid milk since January 1931, though at first only in selected cases. A protocol of one case follows:

REPORT OF CASE

Baby R., a first-born child, with right occipitoposterior presentation, weighed 2,000 Gm. at birth. External heat, which was applied because of the subnormal temperature, caused a cutaneous burn. The infant's temperature rose to 40 C. (104 F.). Breast milk, reinforced with Dryco, was used and fluids were administered parenterally. The feedings were poorly taken and gavage was necessary. The stools became loose and watery and the infant appeared to be toxic. Gastric analysis showed a lowered acidity and a massive growth of B. coli on culture. Buffered acid milk was substituted for breast milk and buffered acid water was given between feedings. The stools decreased from nine to four daily on the third day and did not again increase in number. Regurgitation ceased four days after the buffered acid feedings were started. The subsequent course was satisfactory and the infant was discharged forty-three days after birth, weighing 3,500 Gm.

Encouraged by individual results, we initiated a routine procedure that would enable us to study any untoward symptoms resulting from the use of buffered milk for normal new-born, delicate and premature infants. As an analysis of the results of such a program would be difficult without control groups, we made a number of studies with different formulas and used them for purposes of comparison.

The growing tendency to prevent an initial loss of weight by giving weak alkali solutions was a further reason for this report. We are now making a comparative study, which will be reported later, of the effects of buffered acid sugar water and the alkaline sugar mixture that has been recommended by Eder and Bakewell [10] and others. Whether the use of weak alkali solutions promotes unexpected phenomena of a serious nature remains to be seen. It may be that early alkali feedings stimulate the production of gastric acidity in the average normal infant, but before that occurs the earlier danger of hypo-acidity may eventuate.

TABLE 1.—*Comparative Values for Full Term Infants*

Type of Feeding	Number of Infants	Male	Female	First Born	Later Born	Cesarean Section	Abnormal Deliveries, Including Forceps	Average Number of Stools Daily	Average Number of Regurgitations Daily	Birth Weight, Gm.	Average Time of Loss of Weight, Days	Loss of Weight, Gm.	Infants Who Lost Birth Weight, Percentage	Number of Infants Who Regained Birth Weight by 7th Day	Number of Infants Who Regained Birth Weight by 10th Day	Average Gain in First Ten Days, Gm.	Infants Who Were Below Birth Weight at Discharge, Percentage	Infants with Marked Icterus Neonatorum, Percentage	Morbidity, Percentage
Buffered lactic acid evaporated milk	117	65	52	81	36	11	17	2.9	0.57	3,334	2.2	151.4	4.5	74	84	+100.5	6.7	11.9	9.4
Artificial feeding*	42	18	24	31	11	9	3	2.9	0.35	3,365	2.7	159.9	4.8	21	24	+16.0	17.1	21.2	13.3
Breast milk	159	77	82	76	83	2	8	2.6	0.18	3,573	3.3	185.6	5.2	44	81	−4.9	34.6	18.3	5.3
Breast milk and buffered lactic acid milk	141	71	70	79	62	16	14	2.9	0.33	3,275	2.5	131.4	4.0	68	80	+87.3	13.5	10.6	11.3
Breast milk and a complement†	76	48	28	47	29	2	11	2.8	0.25	3,408	2.7	165.5	4.9	24	43	+24.7	19.7	14.4	6.6

* Artificial feeding other than acid milk, e. g., soft curd milk and whole milk dilution.
† Complement other than buffered lactic acid milk.

METHOD

The buffered lactic acid formula used in this study was prepared as follows:

A buffer solution consisting of lactic acid 15 cc., 10 per cent solution of sodium hydroxide 20 cc., and water to total 500 cc. was made up as a stock solution. Equal parts of this mixture and of evaporated milk were used and 10 per cent added Karo was supplied.

This formula has a caloric value of 110 calories per hundred cubic centimeters. The p_H value is 4.2, which corresponds approximately to the hydrogen ion concentration of gastric juice at the time of optimum digestion in an infant who is being fed cow's milk.[11] In the clinic this special formula was used for infants when nursing was considered impossible because of prematurity or complications such as sepsis or cesarean section; when the mother did not wish to nurse her

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infant, and also to complement the breast feeding of infants who weighed less than 3,000 Gm. Most of these infants were from families in the lower social stratum, some being illegitimate.

The formula was started eight hours after birth except in the case of premature infants, for whom about six hours elapsed between the time of delivery and the first feeding.

RESULTS

There was no difficulty in initiating the buffered lactic acid formula, and it was the general impression that this formula was easier to start and increase than the straight lactic acid mixture. The infants fed on buffered lactic acid milk appeared to be satisfied and

TABLE 2.—*Premature Infants Fed on a Formula Other Than That of Buffered Lactic Acid Milk*

Infant	Sex	Birth Weight, Gm.	Weight on 10th Day, Gm.	Number of Days in Hospital	Weight at Time of Discharge, Gm.	Average Number of Stools Daily	Average Number of Regurgitations Daily	Clinical Abnormalities	Pregnancy	Average Period of Loss of Weight, Days	Loss of Weight, Gm.	Percentage of Birth Weight Lost	Birth Weight Regained, Days	Total Gain, Gm.	Average Daily Gain, Gm.
W[1]	♀	1,520	1,540	45	3,290	6	0.8	0	1	4	120	7.9	9	1,770	39.3
Z	♀	1,480	1,600	40	2,500	4	0.5	Cesarean section, icterus	3	0	0	0	0	1,020	25.5
P[1]	♂	2,350	2,555	13	2,770	5	0.4	Forceps delivery	1	2	50	2.1	4	420	32.3
C	♂	2,280	2,320	20	2,700	4	1.3	0	1	3	190	8.3	8	420	21.0
McG	♂	2,200	2,130	23	2,700	3	0.9	0	1	3	200	9.1	11	500	21.8
S[1]	♀	1,255	1,140	69	2,710	7	1.5	Icterus	2	5	155	12.4	14	1,455	21.1
W[2]	♀	1,960	2,130	35	3,150	4	0.2	0	1	3	50	2.6	6	1,190	34.0
B	♀	1,430	1,500	65	2,760	3	0	Icterus	3	4	85	5.9	6	1,330	20.5
L[1]	♀	2,250	2,350	23	2,750	4	0.8	0	1	3	80	3.6	5	500	21.8
M[1]	♂	2,380	2,385	25	2,680	3	0.3	Mastitis	1	2	175	7.4	8	300	12.0
E	♀	1,760	1,865	34	2,730	4	0.3	0	1	2	40	2.3	3	970	28.5
S[2]	♀	2,240	2,410	28	3,140	3	0.2	Rhinitis	1	1	65	2.9	2	900	32.1
R[1]	♀	2,000	2,100	26	2,720	3	0.1	0	3	1	70	3.5	6	720	27.7
P[2]	♂	1,150	1,080	88	2,935	5	0.5	Icterus	3	7	200	17.4	17	1,785	20.3
R[2]	♂	1,560	1,810	44	2,860	4	0.4	0	2	2	40	2.6	3	1,300	29.5
G[1]	♀	1,450	1,440	59	2,770	5	0.1	Marked anemia	1	4	125	8.6	13	1,320	22.4
G[2]	♀	1,460	1,440	52	2,770	4	0.1	0	1	6	115	7.9	11	1,310	25.2
L[2]	♀	2,440	2,500	21	3,060	4	0	0	3	2	20	0.9	4	620	29.5
T	♀	2,190	2,310	16	2,400	4	1.3	0	1	3	140	6.4	5	210	13.1
S[3]	♀	2,200	2,380	28	3,100	3	0	0	1	0	0	0	0	900	32.1
C[1]	♀	2,180	2,270	20	2,890	5	0.2	Otitis media	1	1	50	2.2	3	710	35.5
C[2]	♀	1,370	1,290	58	2,700	4	0.4	Thrush	7	4	120	8.8	15	1,330	22.9
H[1]	♂	2,195	2,120	32	2,780	3	0.2	0	1	4	35	1.6	5	585	18.3
P[3]	♀	1,510	1,800	55	3,090	6	0.2	Bronchitis, staphylodermatitis	1	2	40	2.6	4	1,580	28.7
C[3]	♀	2,400	2,540	14	2,710	4	0.1	0	1	0	0	0	0	310	22.1
D	♀	2,280	2,380	26	2,770	3	0	Abscess of scalp	1	2	80	3.5	3	490	18.8
P[4]	♀	1,810	1,820	49	2,720	3	0.2	Icterus	1	6	180	9.9	10	910	18.6
K	♀	2,000	2,070	30	2,750	5	0	Nevus on buttocks	2	3	50	2.5	4	750	25.0
H[2]	♀	2,450	2,335	21	2,710	4	0	Nonspecific conjunctivitis	1	2	110	4.5	16	260	12.4
Total or average	29	1,922	1,987	36.5	2,814	4.1	0.4			2.8	89.1	5.1	6.7		24.6

TABLE 3.—*Premature Infants Fed on Buffered Lactic Acid Milk*

Infant	Sex	Birth Weight, Gm.	Weight on 10th Day, Gm.	Number of Days in Hospital	Weight at Time of Discharge, Gm.	Average Number of Stools Daily	Average Number of Regurgitations Daily	Clinical Abnormalities	Pregnancy	Average Period of Loss of Weight, Days	Loss of Weight, Gm.	Percentage of Birth Weight Lost	Birth Weight Regained, Days	Total Gain, Gm.	Average Daily Gain, Gm.
S	♂	2,480	2,690	10	2,690	5	2.0	Nonspecific conjunctivitis	2	1	150	6.0	4	210	21.0
R[1]	♀	2,380	2,660	13	2,800	5	0.7	0	1	1	110	4.6	3	420	32.3
P	♀	1,960	2,310	27	2,820	6	0.7	Breech presentation	1	3	10	0.5	4	860	31.9
L	♂	2,100	2,280	19	2,520	4	1.2	0	1	2	50	2.4	4	420	22.1
M	♀	2,340	2,300	24	2,840	6	0.3	Cesarean section	1	6	200	8.6	12	500	20.8
A[1]	♂	2,300	2,720	17	3,000	6	0.8	0	2	0	0	0	0	700	41.2
F	♀	2,360	2,590	26	3,060	4	0	0	1	1*	20	0.9	2	700	26.9
D	♀	1,630	1,840	29	2,810	7	1.3	Icterus	3	0	0	0	0	1,180	40.7
C	♀	2,360	2,480	15	2,700	4	0.1	0	2	2	130	5.5	5	340	22.7
A[2]	♂	2,410	2,490	17	2,790	6	0.2	0	1	0	0	0	0	380	22.3
A[3]	♀	2,310	2,430	16	2,720	3	0.5	Nonspecific conjunctivitis	1	2	30	1.3	3	410	25.6
B[1]	♂	2,120	2,480	26	2,860	6	0.8	0	3	1	60	2.8	2	740	28.5
T	♀	2,430	2,290	33	3,060	2	0	0	5	5	200	8.2	12	630	19.1
B[2]	♂	2,450	2,470	25	3,020	3	0.1	Cesarean section, icterus	8	2	90	3.7	5	570	22.8
G	♂	2,000	2,330	18	2,700	4	0.4	0	2	4	45	2.3	5	700	38.9
Y	♂	1,600	1,410	29	2,180	8	1.8	Died of atelectasis	1	3	370	23.1	17	580	20.0
McV	♀	2,410	2,340	17	2,620	3	0.5	0	2	5	190	7.9	7	210	12.4
B[3]	♀	2,370	2,720	11	2,700	3	0.6	0	1	5	70	2.9	6	330	30.0
H	♀	2,390	2,600	20	2,700	3	0.2	0	1	0	0	0	0	310	15.5
R[2]	♀	2,350	2,640	17	2,740	6	0.3	0	2	1	110	4.7	5	390	22.9
G	♂	1,780	2,030	34	2,785	5	0	Abscess of arm	3	3	50	2.8	4	1,005	29.6
L	♂	2,060	2,150	25	2,720	6	0.5	0	2	4	120	5.8	7	660	26.4
Total or average	22	2,209	2,420	21.3	2,765	4.8	0.6			2.3	91.1	4.2	4.9		26.1

The four hour schedule was used except for premature infants, who were usually fed every two or three hours by gavage or with a Breck feeder or medicine dropper. All full term infants fed on this formula were offered 110 calories per kilogram of body weight daily. Breast fed infants were offered 10 per cent Karo water after nursing, so that the caloric intake was normal but never in excess of 2 ounces (60 cc.) at a feeding. Water was given freely to all infants between feedings.

showed excellent tissue turgor. The stools were somewhat lighter in color than those of breast fed babies, but the average number was about the same in the two groups. Although regurgitations appeared to be more frequent in this group, this is not a true representation of conditions. Early in the study a more concentrated formula was employed, but when the strength was

reduced, as previously outlined, excessive regurgitation was adequately controlled. There was no gastro-intestinal disturbance severe enough to require discontinuance of the use of the buffered mixture, and in some cases of diarrhea improvement was noted when the original formula was changed to buffered lactic acid evaporated milk.

Table 1 shows the results obtained with various formulas employed for full term infants during the period of this study, beginning Jan. 1, 1931. It is obvious that the initial loss of weight was less prolonged in the group who were fed the buffered milk (2.2 days) and averaged only 4.5 per cent of the birth weight. Both these figures surpassed similar ones for infants who were fed other types of artificial food. The results were better when buffered lactic acid evaporated milk was used to complement breast feeding, both as regards the initial loss of weight and its duration. We believe that these figures are truly comparative since the average birth weight, which was slightly less in the buffered lactic acid group, was balanced by the greater incidence of first born infants in that group. The results in all our various series of studies are better than those reported previously by older authors. Fleischmann [12] reviewed the results of a number of studies on feedings and found that the total loss of body weight averaged 6.6 per cent of the birth weight (assuming the latter to be 3,300 Gm.). In a series of 300 breast fed infants studied by Ramsey and Alley,[13] the average initial loss of weight was 240 Gm. and the average duration of loss was three days. Bergmann [14] reported an average loss of 7.8 per cent of the initial weight in a group of 1,000 infants. It may be assumed from these statistics that buffered lactic acid milk has a definite influence in reducing the initial loss of weight and its duration.

Approximately 72 per cent of the infants fed the buffered lactic acid formula had regained their birth weight by the tenth day, as compared to 57 per cent of those fed on other artificial foods and 51 per cent of those who were breast fed. Schulz,[15] in a study of 600 infants, showed that 48 per cent had regained their original weight in ten days. Twenty-five per cent of the infants in Ramsey and Alley's series had regained their birth weight before being taken from the hospital on the tenth day. In a series of reports of 1,000 breast fed infants, Bergmann found that only 11.4 per cent had reached birth weight by the tenth day and 21.17 per cent by the end of the second week. The smaller number of infants discharged while below birth weight (6.7 per cent) is as striking as the higher percentage of recoveries of birth weight in the first ten days for the infants fed on buffered lactic acid milk. The period of hospitalization was approximately identical for all groups tabulated. The buffered lactic acid evaporated milk formula promoted a more rapid recovery of birth weight than any of the other types of infant feeding.

The average gain in weight of the children fed on the buffered lactic acid evaporated milk for the first ten days of life was 110.5 Gm., which surpassed that of any other group. In this period the infants fed on buffered lactic acid milk showed approximately seven times as great an increase in weight as the other artificially fed infants. This increase in weight was reflected in the excellent tissue turgor and muscle tone of these infants. Furthermore, the morbidity in the group was almost as low as that recorded for breast fed infants. Our figures support Grulee's [16] contention that the morbidity incidence in breast fed infants is less than in those who are artificially fed. However, if artificial feeding must be used, buffered lactic acid milk seems to be ideally suited for the purpose.

The buffered lactic acid formula is well borne by premature infants, as is shown in tables 2 and 3. This group was composed of twenty-two infants, 45 per cent of whom were boys, approximately the same number being first born. In the other group (table 2) of twenty-nine infants, 24 per cent were boys and 69 per cent were first born. The average birth weight in the latter group was 1,922 Gm., slightly lower than that of the group on the buffered formula (2,209 Gm.). The initial loss of weight in those fed on buffered lactic acid milk was 4.2 per cent and continued over a period of two and three-tenths days. In the miscellaneous group the average initial loss was 5.1 per cent of the birth weight, and the average duration of the loss was two and eight-tenths days. The average daily gain for those on the buffered formula was 26.1 Gm.; for the miscellaneous group, 24.6 Gm. These figures compare favorably with any we have seen reported in the literature for this age period. They are slightly higher than those of Hill,[17] who in a series of eighty-two premature infants on a formula of three parts of breast milk and one part of evaporated milk showed an average gain in weight of 0.766 ± 0.11 ounce (22 ± 3 Gm.) daily. Gleich [18] found an average weekly gain of 148.5 Gm. (daily average 21.2 Gm.) in a series of twenty premature infants fed on lactic acid milk. He reported that there were no gastro-intestinal disturbances, which is in accord with our results with the buffered lactic acid formula. The morbidity is considerably less in the group fed on buffered lactic acid than in the comparable miscellaneous one (18.2 and 24.2 per cent, respectively) also, in spite of a greater number of boys in the buffered group, there was no increased incidence of icterus neonatorum.

CONCLUSION

It has been stated [19] that acidified milks should not be given to infants less than 6 weeks of age, as they are not well tolerated. This contention has been challenged, however, by many and our study leads us to conclude that not only is buffered lactic acid milk exceedingly well tolerated but also, from a clinical standpoint, infants fed on this formula show (1) less initial loss of weight and more rapid recovery of birth weight, (2) less icterus neonatorum and (3) a more substantial gain over the birth weight at the end of the hospital period. Premature and congenitally debilitated infants are particularly benefited by such a buffered lactic acid evaporated milk formula.

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Clinical Notes, Suggestions and New Instruments

DINITROPHENOL CATARACT

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We present two cases of acutely developing cataracts in relatively young people, which came on following the administration of dinitrophenol and which we consider to be referable to the same etiology. One of these cases we have had the opportunity of studying at the Massachusetts Eye and Ear Infirmary, and the other has been brought to our attention through the courtesy of the Johns Hopkins Hospital staff.

CASE 1.—M. L., a 38 year old Scotsman, entered the Massachusetts Eye and Ear Infirmary in May 1935, complaining of a haze before his eyes. The family history was irrelevant. Both parents had lived to old age and neither had had significant ocular trouble to the time of their deaths. Several siblings were living and well and without ocular complaints.

The patient had been a proofreader for some years and was not exposed to industrial hazards. He had always been well but was somewhat overweight.

In February 1934 he began taking dinitrophenol for weight reduction, at first in a dosage of 3 grains (0.2 Gm.) daily but rapidly increased to 8 grains (0.5 Gm.) daily. While taking the drug the patient experienced periods of excessive weakness, lasting from one to two hours, which would come on at the time of maximum perspiration. In addition there was a throat infection, which seemed to accompany the use of the drug. No blood study was made at this time. After taking the drug for approximately four months and losing from 2 to 3 pounds weekly, the patient began to notice paresthesias of his extremities of momentary duration. Later the paresthesias became more lasting and extensive, resulting in a continuous numbness of his ankles and toes. Eventually he experienced intense shooting pains in the tips of the toes and the joints; later he had similar pains in his hands without at any time swelling or other evidence of inflammation. His extremities felt so hot that he could not tolerate bed covers, even at freezing temperatures. Following the attacks of pain, his extremities were decidedly hyperesthetic and weak, so that he was forced to use crutches. The patient discontinued use of the drug but the symptoms lasted approximately six weeks. On thorough medical examination at this time, no significant changes were noted other than the neuritis with loss of light touch of the lower extremities, for which the drug was considered responsible. About this time, or shortly before, the patient began to have some visual difficulty. Unfortunately no adequate examination of the eyes was made at this time. In January he had his glasses changed but still "could not focus." His vision became progressively blurred during the next few weeks; hence he came to the Massachusetts Eye and Ear Infirmary.

Physical examination revealed nothing of note other than moderate obesity. There was no evidence of glandular dysfunction or of premature senility.

The ocular examination gave practically identical results in the two eyes and may be described, therefore, as one. The vision was 20/20 seen through a haze.

Refraction: OD -0.75 -0.25×180; OS -1.00 -0.25×180. Accommodation, 2 diopters.

The corneas were clear. There were no keratitic precipitates, but there was a faint outstanding beam in each aqueous without any formed particles. The irises were normal. There were many fine stippled and polychromatic opacities in the anterior lens, the subepithelial cortex forming a superficial shell. There were no definite crystals. Many vacuoles under the epithelium protruded onto the surface, thereby roughening it. There was a striking accentuation of these opacities in a central region about 5 mm. in diameter, i. e., in a semidilated pupillary area. The rest of the anterior cortex was clear except for a few round punctate opacities, probably coronary in character. The nucleus was clear. The posterior cortex, where changes were the most marked, showed a shell-shaped opacity in the central region, corresponding to the opacity of the anterior cortex. This formed a golden yellow, striped opacity of the posterior cortex, outlining the sutures. It was poorly demarcated from the rest of the superjacent cortex, but fairly sharply demarcated from the periphery of the posterior cortex. The vitreous, which could be seen through the periphery of the lens, appeared normal. The fundi were normal. The disks were of good color. The vessels were normal. There was no exudate, hemorrhage or other lesion.

The patient was seen again two weeks after the previous visit. At this time, vision was reduced to the counting of fingers at 2 feet, with proportionate clouding of the lenses. The subepithelial fine opacities, with many vacuoles, were present as before but seemed insignificant compared with the gross flocculent precipitates throughout the entire anterior cortex. These resembled the opacities of a rapidly developing senile cortical cataract. The opaque posterior cortex could be appreciated only by the contrawise movement of the light reflex. These opacities now extended to the periphery of the lens. No red reflex could be obtained from the fundus. Subsequently the patient had simple cataract extraction in each eye, with uneventful convalescence. The fundi, which are again visible, still show no lesion.

Serologic examinations gave negative results. Chemical examination of the calcium, sugar, nonprotein nitrogen and cholesterol content of the blood gave negative results. Red blood corpuscles numbered 5,360,000; white blood corpuscles, 8,850, with a differential count of polymorphonuclears 59 per cent, lymphocytes 31 per cent, mononuclears 8 per cent, eosinophils 1.5 per cent and basophils 0.5 per cent.

CASE 2.—R. A., a white woman, aged 25, married, was admitted to the Johns Hopkins Hospital, April 28, 1935, with the complaint of obesity, nervousness, and rapidly failing vision.

The past history and the family history were essentially negative.

Two and one-half years before entry, the patient had a rapid gain in weight following pregnancy. One year before entry, she became extremely nervous. Four months before entry, because of another rapid gain in weight, she was given thyroid and dinitrophenol, the latter in 1½ grain (0.1 Gm.) capsules three times a day. She continued this medication for approximately one month. (There was some question of her having taken dinitrophenol, for a short period, one year previously.) Three or four weeks before entry she noticed a beginning loss of vision in her left eye.

The patient was obese and did not appear to be iil. Nothing of any significance was found except for her eyes and the obesity. There was no evidence of any glandular dyscrasia. The report of the eye consultation was as follows: "External examination, lids negative; conjunctivae and corneas clear. Tension, external, ocular muscles and pupils normal. Ophthalmoscopic: Right eye, some clouding along the lens sutures. Fundus distinctly seen and apparently normal. Left eye, complete clouding of lens. Fundus cannot be seen. Vision: R. E. 20/30; L. E. light perception. Fields normal. Impression: incipient cataract of right eye; mature cataract of left eye.

The Wassermann and flocculation tests were negative. Blood calcium was 9.69 mg. per hundred cubic centimeters; sugar, 82; nonprotein nitrogen, 25; van den Bergh test, negative; red blood corpuscles, 4,900,000; white blood corpuscles, 8,160; differential, normal. The urine was normal. The basal metabolic rate was plus 48 (fairly satisfactory), plus 8 (satisfacfactory), plus 22 (satisfactory).

COMMENT

These two instances of rapidly developing cataract of a characteristic morphology occurred in relatively young persons in whom thorough study failed to reveal any etiologic factor other than dinitrophenol. The type of cataract which the first patient showed was, per se, suggestive of some systemic intoxication. The initial opacities occupied predominantly the posterior cortex but were not clearly demarcated from the surrounding areas. They progressed with extreme rapidity and formed a characteristic polychromatic luster in the zone of specular reflection. This is the type of cataract which Vogt[1] calls cataracta complicata and which is characteristic

1. Vogt, A.: Spaltlampen Microscopie **2**: 536.

of exogenous injury.[2] We did not have the opportunity to make slit lamp studies in the second case, but the described accentuation of suture lines, together with the apparent rapidity of development, points to the same type of cataract. In view of the morphology of the lens changes in our case and the known effects of dinitrophenol on tissue metabolism, it seems likely that the cataracts are the result of damage to the lens epithelium rather than to primary precipitation of the lens constituents. This is why the toxic effects, as in our cases, occur not as immediate reactions but after prolonged use of the drug and may occur after the drug has been discontinued. It is significant that we have immersed immature cataractous lenses (removed intracapsularly) in a 2 per cent solution of dinitrophenol without the development of further opacities, as we might expect were it a precipitation of the lens substance.

In the two cases reported here only therapeutic doses had been taken, and cataracts developed subsequently. Toxic neuritis also developed in case 1, but no other evidence of intoxication appeared in case 2.

Massachusetts Eye and Ear Infirmary.

CATARACT FOLLOWING THE USE OF DINITROPHENOL

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Horner, Jones and Boardman[1] reported several cases of cataract following the use of sodium dinitrophenol as an adjunct in the treatment of obesity. Their description of the lens changes are somewhat similar to those found in tetany and myasthenia gravis. Recently a case was observed at the eye dispensary of the Cook County Hospital, which is herein reported. It will be observed that not only the lens but also the refractive error has undergone changes, which are not unlike those reported by Horner, Jones and Boardman. Also, apparently when other lens changes have occurred prior to the taking of the drug, there is a possibility that this may hasten the further development of cataractous changes in the lens. Work on lower animals with this drug so far as the eye is concerned is indicated, not only for its scientific value but because of the widespread use of the drug.

REPORT OF CASE

Mrs. K., aged 44, white, was seen July 12, 1935, complaining of loss of vision in both eyes over a period of about six months. The initial loss of vision occurred quite rapidly in November 1934. She consulted an optometrist, who gave her glasses, which did not improve her vision. She was seen by an ophthalmologist (Dr. C. P. Sullivan) in March 1935, who noted at this time that she had cataracts which were not ready for operation. She was given a plus 0.50 sphere in each eye and plus 1.00 sphere added for near vision. Her vision then was 0.5 in each eye. She continued to get worse. She had been taking three capsules of dinitrophenol daily for a period of about a year. She lost 60 pounds (27 Kg.) She stopped taking the drug about two weeks prior to examination.

Examination later revealed the vision 0.2 in each eye.

External ocular examination was negative. Homatropine refraction revealed on retinoscopy R plus 3.00 w plus 0.50 c 60; L plus 2.50 w plus 0.50 c 90. The trial case showed no improvement with the proper lenses. Ophthalmoscopic examination showed many lenticular opacities. The fundi were not seen clearly but were apparently normal.

Slit lamp examination revealed normal corneas and anterior chambers. The lenses showed many subcapsular striate opacities anteriorly, with numerous small white round opacities deep in the central cortex. The posterior cortex resembled a posterior cortical saucer-shaped cataract. It had an intense copper appearance with a zone of iridescence that was quite pronounced. The left lens showed more marked changes than the right.

A second case seen by Dr. Sanford Gifford is reported with his permission: Mrs. F., an otherwise healthy woman of 42, had taken dinitrophenol for slight obesity during 1934. The exact dosage could not be ascertained; she had lost 2 pounds a week for several months. Physical examination and blood chemistry were essentially negative. The blood calcium was 9.9 mg. and blood sugar was not increased. The drug was stopped in August 1934. Three months later vision was reduced, but was improved by glasses. Two more changes of glasses were made, but in April 1935 she was unable to read with any glasses. When she was first seen by Dr. Gifford, in July 1935, vision in both eyes was reduced to light perception with good projection. Both eyes showed intermescent cortical cataract, the cortex being white and flaky and the anterior chambers shallow. The right eye was operated on, July 15, operation being uneventful and vision 20/25 at the first test after a needling. Although the patient was of an age when senile cataract might possibly have developed, the rapid course of the bilateral opacities suggests a probable relation to the drug taken. By analogy with other forms of nonsenile cataract, such as that seen in parathyroid tetany, it is not unreasonable to suppose that the lens changes, once begun during administration of the drug, might go on to complete opacity after its discontinuance. In the late stage at which this case was seen, there was nothing characteristic about the clinical picture, a situation that exists also in the late stages of other toxic forms of cataract. In the first case, however, the picture resembled that described by Horner and his associates.

COMMENT

A case is reported of bilateral anterior and posterior cortical cataract in a comparatively young person, coming on suddenly after prolonged treatment with dinitrophenol, with a great loss of vision over a period of less than four months, and showing a marked increase in the hyperopia. The well known fact that the drug causes a tremendous dehydration of tissue may hasten the maturity of lens opacities already present. An important fact is that, as shown by these and other reported cases, cataract may develop on average dosage of the drug, and without any general symptoms suggesting harmful effects. In the second case the opacities were first noted some time after the drug had been discontinued.

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CATARACTS FOLLOWING DINITROPHENOL

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Mrs. M. O., aged 37, came, Sept. 18, 1933, for the treatment of obesity. Her past history was unimportant except for a gonorrheal infection earlier in the same year. She had three children, one of whom had congenital cataracts. She had been obese since childhood. Her weight was over 300 pounds and she had not reduced to any extent on diet and thyroid in small doses. She was put on a 1,200 calory diet and given alpha-dinitrophenol, 5 grains (0.3 Gm.) daily, for two weeks. She then took 10 grains (0.6 Gm.) daily for two weeks, followed by two weeks of alternating the larger with the smaller dose. Feb. 21, 1934, she weighed 283 pounds (128 Kg.) and felt well. The dosage was reduced to 6 grains (0.4 Gm.) daily and two months later to 2 grains (0.13 Gm.) daily. From June 6 to July 25 she took 4 grains (0.26 Gm.) and on the latter date was found to be about six weeks pregnant.

During pregnancy the drug was discontinued except for a period of two weeks during which she took 2 grains (0.13 Gm.) daily, beginning Oct. 24, 1934. She had seven antepartum examinations between July 25, 1934, and March 6, 1935. No albumin, sugar or casts were ever found. Her blood pressure was 120 systolic, 78 diastolic, on the first visit and 150 systolic, 96 diastolic, on the last, with no higher readings between these dates.

She first noted failing vision early in November. Nov. 26, 1934, the ophthalmologist's report was "incipient cataracts, both eyes." Jan. 26, 1935, she was unable to count fingers at 2 feet with either eye. She was delivered of a normal baby, March 8. March 27 her cataracts were pronounced mature, and removal

2. Die Cataracta complicata . . . welche nicht auf Grund jenes Gesetzes des senilen . . . sondern die Folge bestimmter exogener Schäden sind. (Cataracta complicata, unlike senile cataracts, are the result of definite exogenous injuries.)

From the Ophthalmologic Service, Cook County Hospital, and the Department of Ophthalmology, Northwestern University Medical School.

1. Horner, W. D.; Jones, R. B., and Boardman, W. W.: Cataracts Following the Use of Dinitrophenol, J. A. M. A. **105**: 108 (July 13) 1935.

was advised. April 18, the right lens was removed by Dr. L. O. Grant, who reported it a mature cataract. Vision was brought up to 20/20 with refraction.

COMMENT

Two factors other than the use of dinitrophenol are to be considered in this case: the cataracts formed late in pregnancy, and they occurred in a woman who had given birth to a child with congenital cataracts.

SUMMARY

A woman, aged 37, took 1,900 grains (126 Gm.) of alpha-dinitrophenol over a period of a little less than a year and at the end of that time developed bilateral mature cataracts in a period of four months.

LATE DEVELOPMENT OF CATARACT FOLLOWING USE OF DINITROPHENOL ABOUT A YEAR BEFORE

T. D. ALLEN, M.D., AND V. M. BENSON, M.D., CHICAGO

April 4, 1922, the vision of Miss V. M. B., aged 25, a student at Rush Medical College, was 20/20 + in each eye, with and without a very slight correction for compound hypermetropic astigmatism, fitted after careful refraction with homatropine. The appearance of the eyes was perfectly normal externally and internally. Muscle balance was normal.

In May 1927 a slight change of the glasses was necessary. With these her vision was 20/15, and her near point from 18 to 20 cm. Again no changes were found in the interior of the eyes.

March 22, 1935, at the age of 38 years, she complained of clouding of the vision, which had seemed to come on rather suddenly about three weeks before. Accommodation was slightly reduced, but there was no essential change in the refraction or in the central fields of vision. When the pupils were widely dilated there was found with the slit lamp to be an irregular, granular sheen on the posterior surface of each lens, and a few very fine deposits, like a sprinkling of dust, on the back of each cornea. Also there was a slight atrophy of the pigment border of each iris.

The general medical examination was made by Dr. Fred M. Drennan, who reported one small tonsil stump questionably infected, a basal metabolic rate of —12, blood calcium 10.3 mg. per hundred cubic centimeters of serum, and adiposity (weight 196 pounds [89 Kg.]). Dr. Drennan suggested that she take thyroid and anterior pituitary extract. The latter upset her, but the thyroid in one-half grain (0.03 Gm.) doses three times a day caused an increase in the basal metabolic rate of about 18 points.

She was seen at frequent intervals, always complaining of increasingly hazy vision. June 4 the vision of the right eye was 20/30 and of the left eye 20/40 —. July 1 the vision of the right eye was 20/70, of the left eye 4/200. July 9 the vision of the right eye was 20/70 +, of the left eye the counting of fingers at 2 feet. July 17 the vision of the right eye was 20/30 — (see comment) and of the left eye counting of fingers at 1 foot.

June 4 she suggested dinitrophenol as the possible cause. She had been taking this drug in an average daily dose of 0.4 Gm. from Dec. 30, 1933, to early in June 1934, a total of approximately 73 Gm., or 1,460 capsules of 0.05 Gm. each. The drug was taken on a basis of from 3 to 5 mg. per kilogram. It resulted in a loss of weight of 32 pounds (14.5 Kg.). She stopped the drug in June on account of the warm weather but started again in September because she had regained about half the weight she had lost. However, it upset her gastro-intestinal tract, so she stopped taking it after a few days and did not start again. She had a little difficulty in seeing (accommodation?) during October 1934.

An interesting comment of hers on July 1, 1935, was that, two weeks before, the vision of the left eye suddenly improved, and for about five days she could see quite well. Then suddenly the vision diminished. July 1, after thorough dilation of the pupils, we examined with the slit lamp and made the following comment: Right eye, fine granular changes immediately beneath the anterior capsule of the lens. With a very fine beam, these changes were seen to begin at an irregular depth immediately beneath the capsule. There was only a very faint haze in the cortex proper. No distinct nucleus of the lens was seen, and the posterior capsule had the appearance of a granular or hammered copper surface. Left eye, anterior chamber shallow; mother of pearl appearance of the cortex, with a distinct interval between the opaque cortex and the capsule. In each eye, very few fine dustlike opacities on the back of the cornea, but no evidence of iritis, and the tension was 17 mm. (Schiötz) in each eye, both before and after dilation. (The tension has never been found above 20 mm.)

July 13 the vision of the right eye seemed suddenly to improve, and on the 17th it was 20/30 —. She felt that this improvement was similar to that of the left eye immediately before the vision in that eye became very dim.

Left linear extraction was performed August 6 and right linear extraction August 9, with extremely little reaction and practically no cortex left. On August 12, right vision with sphere + 11 cylinder + 1 axis 180 = 20/40 —; left vision with sphere + 12 cylinder + 1 axis 165 = 20/50. The subnormal vision is easily accounted for by wrinkling of Descemet's membrane.

This patient has taken regularly for the last several years one glass of orange juice or tomato juice, beginning therefore before she ever took dinitrophenol and continuing up to the present time.

SUMMARY

There was a history of the ingestion of approximately 73 Gm. of dinitrophenol over a period of about five and a half months, with the first evidence of cataract seen nine months after the drug was discontinued. The cataracts developed simultaneously, but one more rapidly than the other, one becoming complete within five months.

122 South Michigan Avenue.

PNEUMOCOCCUS (TYPE III) MENINGITIS; RECOVERY

REUBEN STEINHOLZ, M.D., AND MORRIS GLEICH, M.D., NEW YORK

Pneumococcus meningitis is a highly fatal disease. Cases of recovery are so rare that the successful outcome of one, particularly a type III, warrants reporting.

A girl, aged 7 years, with a normal developmental history and the usual childhood diseases, stuck a rubber eraser from the end of a pencil into her right ear. A roentgenogram revealed this foreign body in the right internal auditory meatus. Under general anesthesia this object was removed five days later. The postoperative course was uneventful. The child was discharged two weeks later with a right purulent otitis media. A right facial palsy was reported six weeks later, lasting for two weeks.

Her present illness began nine weeks after the original trauma, with headache, vomiting and refusal of food. The next day, on admission to the hospital she had a convulsion. The temperature was 102 F., respiration rate 40 and pulse 128. She was pale, irritable and drowsy but easily aroused. She lay in bed with her knees and hips flexed and showed marked nuchal rigidity. The pupils were moderately dilated, were equal and reacted to light. No nystagmus or strabismus or facial palsy was noted. The tongue did not deviate from the midline. The left drum was normal but the right drum was absent. There was a small mass protruding from the middle ear. A moderate sanguinopurulent discharge was present. The right mastoid was not tender, but hearing from the right ear was completely absent.

The tonsils were moderately enlarged and injected. The heart and lungs were normal. Examination of the abdomen was negative. The Kernig and Babinski signs were absent as well as the knee jerks.

Urinalysis, blood culture and the Pirquet test were negative. The blood count showed 14,600 white blood cells, 79 per cent being polymorphonuclears. Roentgenograms of the lungs and both mastoids were negative. Roentgen examination of the sinuses revealed clouding of the right and left antrums with thickening of the mucosa. Cultures of the right ear were unsatisfactory.

From the Pediatric Department, Harlem Hospital, Dr. Thomas A. Martin, medical director.

Through the lumbar route 25 cc. of cloudy fluid under moderately increased pressure was removed and replaced with 20 cc. of antimeningococcus serum. The fluid showed 150 cells, with 80 per cent polymorphonuclears. Globulin and albumin were increased and dextrose was present. No organisms were seen in the smear but culture revealed a type III pneumococcus. This was confirmed by the pneumonia laboratory as well.

Since this report did not arrive for a few days, we continued to use antimeningococcus serum. The next day 10 cc. of cloudy fluid was removed with difficulty by the lumbar route, so a cistern puncture was done. Twenty cubic centimeters of cloudy fluid was obtained showing 200 cells, 90 per cent of them being polymorphonuclears. Twenty cubic centimeters of antimeningococcus serum was administered through the cistern puncture and 10 cc. intramuscularly.

On this day she had a convulsion lasting ten minutes and involving the left side of the body. The next day she was much brighter and answered questions but still complained of headache. The right knee jerk was now present, the neck still rigid and the temperature 100 F. Another cistern puncture was performed and 20 cc. of cloudy fluid was obtained. This was replaced by 20 cc. of antimeningococcus serum. Another 20 cc. of antimeningococcus serum was given intramuscularly.

On the third day after her admission the blood showed specific pneumococcus type III antibodies. Twenty-four hours later the temperature was normal, nuchal rigidity was diminished and the child sat up and played. Improvement continued rapidly and in a few days nuchal rigidity had completely disappeared.

The use of type III antipneumococcus serum was discouraged on the third day when the laboratory reported pneumococcus type III in the spinal fluid. At this time the child was clinically much improved and showed pneumococcus type III antibodies in the blood.

A lumbar puncture done two weeks after admission was perfectly clear with a cell count of 4 lymphocytes. The neurologic examination was negative.

This case of pneumococcus meningitis is probably of otitic origin. The facial palsy and the left-sided convulsion point to a chronic otitis media as the exciting cause. The brain and meningeal involvements were evidently localized rather than widespread. Enough of the infection spread to the subarachnoid space to produce a cloudy spinal fluid.

The child did not succumb to the infection because it was localized and the type of pneumococcus was attenuated. Two laboratories reported that the mice infected with the specimens of spinal fluid from the patient did not die. This verified the low virulence of the organism.

Most authorities, as Osler, Holt, Neff and Kolmer, report that pneumococcus meningitis is invariably fatal. The few isolated cures reported were instances in which antipneumococcus serum or ethylhydrocupreine had been tried.

Ratnoff [1] reported a cure of type III pneumococcus meningitis treated with ethylhydrocupreine. Kolmer [2] used ethylhydrocupreine in the proportion of 5 cc. of a 1:1,000 solution in physiologic solution of sodium chloride per kilogram of body weight, giving two injections a day for four days. Weinberg [3] reported the cure of a case of type III pneumococcus meningitis, using the Nott treatment; i. e., retention enemas of potassium permanganate, 4 ounces (120 cc.) every four hours (2 grains [0.13 Gm.] of potassium permanganate to 1½ pints of water). Harkavy [4] reported a type I case cured by type I serum. Globus [5] reported a type I case cured by forced drainage through cistern and lumbar puncture routes.

269 West Eighty-First Street—9 Post Avenue.

1. Ratnoff, H. L., and Litvak, A. M.: Pneumococcus Meningitis Treated with Morgenroth's Optochin Hydrochloride: Report of Case with Recovery, Arch. Pediat. **43:** 466-472 (July) 1926.
2. Kolmer, J. A.: Chemotherapy and Serum Therapy of Pneumococcus and Streptococcus Meningitis: I. Résumé of Present Status of Treatment of Septic Meningitis with Recommendation of Method, Arch. Otolaryng. **3:** 481-513 (June) 1926.
3. Weinberg, M. H.: Case of Pneumococcus (Type III) Meningitis Treated with Potassium Permanganate: Recovery; Plea for Its Trial, J. Nerv. & Ment. Dis. **74:** 38-45 (July) 1931.
4. Harkavy, Joseph: Pneumococcus Meningitis: Recovery with Serum Therapy, J. A. M. A. **90:** 597-599 (Feb. 25) 1928.
5. Globus, J. H., and Kasamin, J. I.: Pneumococcus (Type IV) Meningitis: Report of a Case Treated by Forced Subarachnoid Drainage, with Recovery, J. A. M. A. **90:** 599-601 (Feb. 25) 1928.

ELECTROSURGICAL EXTIRPATION OF XANTHOMA

REPORT OF TWO SEVERE CASES

LEWIS J. GORMAN SILVERS, M.D., NEW YORK

Two sisters, S. and A. R., identical twins, aged 36, complained of the unsightly appearance of the deep yellow patches completely encircling their eyes. The family history was entirely negative. No one in their family of six, all older, had ever suffered from this type of disfigurement. Prior treatment consisted of the application of a chemical caustic, probably monochloracetic acid according to the method of McGuire,[1] at the Skin and Cancer Hospital. The prompt recurrence of the chamois-like patches with a deeper yellow hue followed after several months' treatment and observation.

Xanthoma palpebrarum planum is a fatty degeneration of the superficial fibers of the orbicularis oculi muscle, as clearly shown by the work of Pollitzer.[2] The etiology is as yet unknown. Pathologically the epidemis, cutis, hair follicles and glands are normal; however, the greater part of the cutis is

Fig. 1.—Appearance prior to treatment.

packed with cell-like masses known as xanthoma cells. These so-called cells are fragmented and degenerated remains of muscle fibers with proliferated sarcolemma nuclei. Hence it may be noted that the xanthoma cell is not a cell at all.

The most satisfactory treatment employed by Hazen [3] is electrolysis, the negative pole of the galvanic current being used. In my own hands galvanism was often followed by recurrence, and so the advantages of a definite controllable high frequency current became manifest. Infiltration anesthesia is executed with a very fine hypodermic needle over the area to be desiccated. A small, pointed needle electrode connected to the Oudin or monoterminal high frequency outlet is employed. A current strength that will produce a millimeter spark on fulguration is essential. The spark must not be too intense, as scarification might result. The degenerated, fatty

Fig. 2.—Appearance of patient after electrosurgical extirpation. No sign of recurrence after more than one year's follow up.

fibers are then thoroughly desiccated by the penetrating active electrode. The concomitant destruction of the dermal layers is minimized by the cooling effect of the infiltrating anesthetic. The biterminal or coagulating current must be sedulously avoided, as scarring and pitting might ensue. The strength of the current remaining constant, the time required for total extirpation depended on, first, the amount treated at each sitting and, secondly, the total number of patches present. Treatments were entirely ambulant, being given weekly to each lid alternately. Complete eradication of the chamois-like growths was accomplished in about ten sittings without interfering with the patient's normal activities.

1050 Park Avenue.

Read before the New York Physicians Yorkville Medical Society, May 22, 1935.

1. McGuire: J. Cutan. Dis. **16:** 328, 1898.
2. Pollitzer: J. Cutan. Dis. **28:** 633, 1910.
3. Hazen, H. H.: Diseases of the Skin, St. Louis, C. V. Mosby Company, 1915.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. H. A. CARTER, Secretary.

THE USE OF HEAT IN DISEASES OF THE NERVOUS SYSTEM

CLARENCE A. PATTEN, M.D.
PHILADELPHIA

Heat is frequently used in the treatment of both organic and functional nervous disease and provides a very effective therapeutic agent. It is used in many ways both locally and generally.

HEAT IN THE PSYCHOSES

Heat is generally used systemically in the treatment of the psychoses and is usually of considerable advantage if used over a long period of time. It is definitely of greater value in the agitated and maniacal mental states because of its sedative effect, but it is not particularly effective in the depressions except occasionally in agitated melancholia. In the acute depressions of the manic depressive psychoses it may be of slight value, but experience has shown that it does not influence the course of the disease. The means by which heat is applied in mental states in the order of their efficacy are: 1. The continuous hot bath. 2. The cold pack. 3. The warm pack. 4. Cabinet sweats. 5. Conditioned heat.

The continuous hot bath is used particularly in cases of maniacal excitement and maintains a steady temperature of about 96 to 98 F. and sometimes more. Such baths have been employed in mental hospitals for a considerable number of years and are a necessary part of the modern hospital's equipment for handling excitable patients. Large tubs are used of sufficient length to accommodate the patient comfortably. They are frequently equipped with canvas slings, which are used to keep the patient from contact with the bottom of the tub. The temperature is controlled by a mixer, which regulates the temperature of the water. The attendant, however, must always use a bath thermometer as a check on the thermometer in the mixer. Patients are kept in the continuous bath for various periods of time, depending on their condition. No clothing is worn and any form of restraint is unwise. The soles of the feet and the palms of the hands must be well greased before the patients get into the tub. Many patients receive their meals while in the water, sleep there, and may be kept in the tub for days at a time. The continuous bath offers a means of inducing sedation which is unparalleled so far as physical measures are concerned, and by this means violent patients are controlled more rapidly than by the use of drugs. A caution is to be observed in that a nurse or attendant must be constantly present during these baths to see to it that no harm comes to the patient and that the water is kept at the desired temperature.

In case a properly constructed continuous bath is not available for excitable patients, an ordinary tub can be used for short periods, frequently repeated, provided a nurse or attendant constantly watches the temperature of the water and keeps it at the desired degree of heat.

Cold packs, which are really forms of heat therapy, are given in the following manner: The full length of a mattress is covered by a rubber sheet, over which are placed two or three woolen blankets. A sheet is wrung out in cold tap water and spread over the topmost blanket and the patient laid on it. The sheet is wrapped about the patient and folded over the feet and about the shoulders. The topmost blanket is brought up over the patient and another blanket is spread over him and tucked beneath him. The second lower blanket is folded over the patient and another one spread over him and tucked beneath him. The third, or even a greater number of blankets, is folded about the patient in the same manner. An ice bag is placed to the patient's head, which is supported by a small pillow, and the patient is encouraged to drink water freely. The patient is allowed to remain in the pack until he has perspired freely and usually for a considerable period after that, depending on his condition. Cold packs offer a very effectual means of restraint in excited cases, as well as producing a marked sedative action. Warm packs are used in the same manner as cold packs except that the sheets are not wetted and the blankets are carefully warmed beforehand. Certain patients, however, who are put in a pack only when they are markedly disturbed come to have the idea that it is a form of punishment for them. It is best to use the packs or even the baths at stated times to obviate this reaction.

Neither cold nor warm packs are used in the presence of circulatory or cardiac derangement or when the patient is in a very weakened condition. During the time the patient is in a pack a nurse must be in constant attendance, observing the color and pulse rate of the patient. In case of an abnormal reaction the patient must be immediately removed from the pack. When the treatment is to be terminated, one blanket is removed at intervals so that the patient cools down gradually. A pack is usually followed by a shower and then an alcohol rub or a light massage.

Electrical cabinet baths are frequently used for cooperative mental patients for the purpose of obtaining the effects of varying degrees of heat over a short period of time as well as elimination through free perspiration. Usually the cabinet is followed by a needle spray of warm and then cold water for its tonic effects, and after that massage may be employed.

At the present time certain equipments are being experimented with for the purpose of giving patients conditioned heat. These consist of appliances much like respirators and so constructed that the patient lies wholly within them except that the head protrudes through an opening at one end. The body is thereby subjected to a uniform heat. The temperature of the air, which is moist, is gradually increased until the patient's temperature reaches the desired point, which may be anywhere from 102 to greater degrees. By means of this type of apparatus, effects are obtained similar to those following other methods for the application of continuous heat, with the added advantage of a moistened air. The contraindications are the same as those for the cold and warm packs. Conditioned heat, however, is probably less used in the psychoses than are the continuous tubs, for the obvious reason that a part of its success depends on the full cooperation of the patient, which cannot be obtained as a rule in excited patients when it is most needed.

Various forms of heat therapy are used in the organic psychoses, particularly dementia paralytica. In dementia paralytica the continuous baths are helpful

when the patients are markedly excited, but only for the sedative effects. For the purpose of combating the disease, more vigorous heat therapy is needed. This is accomplished by raising the body temperature to 104, 106 or even higher for a period of hours. Some form of diathermy may be employed but in using diathermy there is always danger of producing burns where the electrodes are placed. Cabinet bakes, electric heat blankets and the conditioned heat apparatus previously mentioned are quite effective.

HEAT IN THE PSYCHONEUROSES

The systematic use of physical therapy in the treatment of the psychoneuroses had its inception under the direction of Dr. S. Weir Mitchell. In the so-called rest cure named after him the use of electric light baths, combined with hydrotherapy, massage and moderate exercise, is of great benefit. The same causes that operate in the production of physical disease in one patient may produce a nervous or mental disorder in another; therefore the physician should be guided by the same general principles and by a balanced conception of therapy.

In the psychoneuroses the so-called tonic electric cabinets given every day and followed by hot and cold contrast showers afford a great stimulus to the patient and in addition occupy a certain part of his time, which is of importance. Hydrotherapy in the form of hot and cold showers alone can be given daily. The method of application of these procedures has been commented on under arthritic and rheumatoid conditions, but it must be again emphasized that electric "baking" with hydrotherapy is only a part of the general treatment of the neuroses and dependence must not be placed on it alone.

HEAT IN ORGANIC NERVOUS DISEASE

Heat is of the greatest value in inflammations of the peripheral nerves and in vascular diseases in which implication of the nervous system is evidenced by pain of greater or lesser severity. In the various neuritides, in neuralgia, in radiculitis or in inflammation of any of the nerves in the limbs, heat, and particularly dry heat, allays the inflammation and pain. In neuritis in certain areas care must be taken to give a sufficient amount of treatment, for the penetration must be deeper in some parts than in others. Heat is only one mode of treatment, as frequently a neuritic condition is part of an arthritis. Electrical treatment, principally in the form of diathermy, may be more efficacious. In cases of toxic infectious multiple neuritis, heat is applied to the extremities by attaching electric light bulbs to the central pole of a cradle placed over the patient. In these cases any degree of heat may be used that is desired and most patients find it very comfortable. The cradle serves the additional purpose of keeping the bedclothes off the patient's sensitive limbs. This form of heat therapy may also be used for a neuritis or vascular disorder localized to one limb and, by continuous application, may afford a progressive relief from the painful symptoms.

In certain vascular diseases of the limbs, such as erythromelalgia, Raynaud's disease, thrombo-angiitis obliterans, thrombophlebitis and endarteritis obliterans, dry heat applied to the diseased parts more or less constantly over a period of days causes an alleviation of the symptoms of pain. It is not a cure but is used mainly for the relief of pain and for improvement of the circulation. The modern operation of sympathectomy offers much more hope of permanent relief in certain types of cases.

Even in chronic diseases of the nervous system, such as hemiplegia or lateral sclerosis, when the limbs are spastic, heat will decrease the spasms and contractures, at least for a time and will moderate other symptoms. In chorea of the acute variety, provided no heart disease exists, any method of applying heat generally will be found to produce remarkably sedative results. Most frequently the continuous tub is employed, but only for an hour or two at a time.

Council on Pharmacy and Chemistry

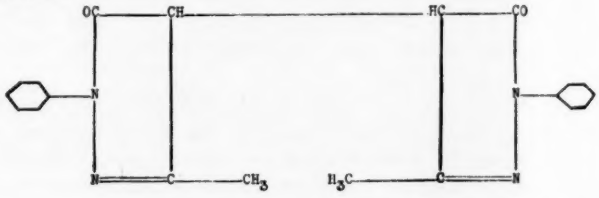
REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

ROSSIUM NOT ACCEPTABLE FOR N. N. R.

Rossium, which is stated to be Di-phenylmethyl-pyrazolonyl, was presented for the Council's consideration by the Medico Chemical Corporation of America. The following structural formula was presented as representing the composition of the product:



The product is marketed in capsule form and is advertised for use in the treatment of drug addiction.

With the information concerning the product, the firm submitted the following material:

1. A typewritten copy of a paper by Dr. Ivan I. Ostromislensky, entitled "Morphinism and Anaphylactic Shock," which appears to have been read at the meeting of the Russian Medical Society of New York, Nov. 25, 1931.

2. A discussion of the chemistry of Rossium, to which is attached a statement, a part of which will be quoted.

3. A Preliminary Report having the title "Rossium," and a subtitle "A New Therapy for Drug Addiction Morphinism-Heroinism-Codeinism-etc."

4. (*a*) Several tables showing the activity of Rossium and of insulin in antagonizing the effects of an antigen in guinea-pigs. (*b*) A similar study with forty-one other preparations.

In the absence of any satisfactory evidence in support of the therapeutic claims made for Rossium, this report will present only so much as may be necessary to give a true indication of the claims made for it. The following is taken from Ostromislensky's paper on "Morphinism and Anaphylactic Shock":

"The theory is that when morphine preparations are injected daily in man for a sufficient length of time there appears in the blood a new kind of protein—an auto-protein which acquires the properties of an antigen. Although formed in the body, this protein acts on the organism in the same manner as a foreign protein, causing the formation of a specific antibody. The quantity of the specific auto-antigen circulating in the system of morphine addicts gradually increases. Therefore, as a rule, a morphine addict requires a gradual increase of his daily dose of the drug. The basic premises and conclusions of this theory may be formulated as follows:

"1. The symptom-complex appearing in morphine addicts at the withdrawal of the drug should be considered as the symptom-complex of the anaphylactic shock.

"2. An individual who takes morphine daily in about three weeks usually becomes an addict, supposedly at the time when the corresponding specific antibody is formed in his system.

"3. The addict's imperative need of morphine can be explained through the ability of morphine to prevent the possibility of chemical reaction between the antigen and its antibody. To avoid the anaphylactic shock,

hence prevent withdrawal symptoms, one must replace the morphine by a chemical substitute preventing the combination between antigen and antibody.

"4. A morphine addict who has stopped taking morphine continues for a long time to be a carrier of the specific antibody. Hence, he may be said to remain in a state of potential addiction for an indefinite length of time. Subsequently, on the very first injection of a quite insignificant dose of morphine, if the antibody still exists, there appears again in the system of the addict a specific auto-antigen which provokes the inevitable relapse.

"5. At any given period of the disease, a definite quantity of the antigen is circulating in the system of morphine addicts. Therefore, at any given period of the disease an addict always requires a definite and precise quantity of morphine which suffices to neutralize all of the auto-antigen present in the system."

The following statement is attached to the second communication, "The Chemistry of Rossium":

"Clinical studies of this preparation have been conducted from 1931 to 1934, particularly at Blythwood Sanitorium, Greenwich, Connecticut; Stony Lodge, Ossining, New York; St. Michael's Hospital, Newark, New Jersey, and Town's Hospital, New York City.

"Clinical observations show that Rossium checks the most severe symptoms of withdrawal in drug addicts (Morphinism-Heroinism-Codeinism, etc.) and markedly decreases all other symptoms.

"The following physicians are amongst those who have had an opportunity to administer Rossium in the cases mentioned:

"Dr. Alexander Lambert, 43 East 72nd St., New York City.

"Dr. P. R. Vessie, % Stony Lodge Sanitarium, Ossining, N. Y.

"Dr. Silkworth, % Towns Hospital, 292 Central Park West, New York.

"Prof. Dr. Ostromislensky, 256 West 116th St., New York.

"Dr. M. W. Openchowski together with Dr. W. J. Donahue, 324 Parker St., Newark, and City Hospital as well as St. Michael's Hospital, Newark.

"Dr. N. N. Harin, 324 Parker St., Newark, N. J."

The Council's secretary wrote to Dr. Lambert calling his attention to the fact that his name was being used in connection with Rossium. Dr. Lambert replied:

"I have your letter of recent date regarding my name in the use of Rossium.

I did not give permission for any such use of it as you mention, that is entirely reprehensible, and I have so written to the Medico Chemical Corporation of America.

I have been clinically trying Rossium to alleviate the withdrawal symptoms of morphinism. This it does exceedingly well, but this is not the eradication of the morphine habit, which is quite another story.

Thank you for drawing my attention to this, otherwise I should not have heard of it."

The letter of the Council's secretary, to which this was a reply, read as follows:

"We are receiving many inquiries from state hospitals, health commissioners, etc., concerning letters sent out by the Medico Chemical Corporation of America on behalf of Rossium. Paragraphs appear in these letters somewhat as follows:

'We wrote you that DR. ALEXANDER LAMBERT of New York is using this drug with great success and we now have other clinical data to substantiate our claims. Animal experimentation as well as clinical experiments with humans, have proven the non-toxicity of this drug, which incidentally, is non-habit forming.'

It seemed advisable for this office to obtain from you a statement as to whether or not your name is being used in this connection with your permission. Your name is always capitalized whereas no other part of the paragraph is so emphasized."

In the presentation submitted by the firm (which accompanied the firm's letter of Oct. 29, 1934), the following statement occurs under "Therapeutic Indications":

"Drug addiction disease (Morphinism, Heroinism, etc.). Rossium checks the most severe symptoms of withdrawal in drug addicts and markedly decreases all other symptoms. In cases of cocain addiction Rossium is inactive."

The tables submitted by the firm support the statement that Rossium prevents the symptoms of anaphylactic shock in guinea-pigs previously treated with an antigen, and according to the theory of Ostromislensky this must be true if it is valuable in reducing withdrawal symptoms (anaphylactic shock) in addicts.

A physician in charge of the allergy laboratory in a large hospital informed the Council's referee that he knew of nothing to support the theory that, when morphine is injected, an auto-protein having the properties of an antigen appears in the blood of man.

The Council cannot accept the fifth statement in the theory of Ostromislensky that at any given period of the disease [morphinism] a definite quantity of the antigen circulates, requiring a definite and precise quantity of morphine to neutralize all of the auto-antigen present in the system, because it is well known that morphine addicts who take excessive daily amounts of morphine (up to 30 grains or more daily), may have the daily dose reduced rapidly without serious inconvenience, until only a very small fraction of the customary dose is taken daily.

Rossium has been known for three years, and has been used in a number of hospitals and by a number of physicians, but no convincing therapeutic evidence in support of the claims has been submitted; it must be remembered that therapeutic evidence means more than unsupported statements. Furthermore, the directions for the use of Rossium include the use of hypnotics and other sedatives such as are commonly used in the treatment of the withdrawal symptoms. Finally, the studies of toxicity are wholly inadequate, and the Council is not convinced that the doses recommended are always harmless.

In the absence of convincing evidence concerning the therapeutic value of Rossium, the Council, without further consideration of its name, chemical properties, pharmacology, etc., declared the product unacceptable for inclusion in New and Nonofficial Remedies.

A statement of the Council's consideration was transmitted to the Medico Chemical Corporation of America in conformance with the Council's custom of giving a firm the opportunity to comment on the report before publication. The firm's reply contained nothing to change the attitude of the Council with regard to acceptance of Rossium, and the firm was so informed. The firm subsequently submitted a further reply which likewise contained nothing to warrant a change in the Council's action. In its letter the firm made the following statement:

"We are well aware of the fact that we are not precluded from presenting additional evidence to the Council and then get the desired admission, but wish to direct the attention of the Council to the fact that the mere publication of the above conclusion of the Council under the above circumstances may cause this applicant unreparable damages and greatly handicap the development of its business without any fault whatsoever on its part."

It thus admits that additional evidence is necessary. The Council desires to point out that its duty is first to the physician and to the public. It would be remiss were it not to inform physicians concerning the status of a preparation which is being actively exploited, for which there is not sufficient evidence to justify claims made, and in the use of which there is the possibility of as yet unknown untoward effects.

Subsequently the firm presented a paper entitled "Preliminary Clinical Report—ROSSIUM, A New Treatment for Drug Addiction," by Herman E. Bauer, M.D. The Council found that this study, which was conducted without careful control, offered no reason for changing its decision to publish the foregoing statement.

In connection with the matter of control evidence for preparations of this sort the Council recalls that two highly qualified men reported that Narcosan was of great value in the treatment of morphine addiction (*M. J. & Rec.* **124**:764 [Dec. 15] 1926). They reported on the treatment of 219 men and 147 women, a total of 366 patients in a special ward. Nevertheless, within a little more than two years, the Mayor's Committee of New York on Drug Addiction, reported that Narcosan treatment was given to sixty-eight patients; that the results were clear-cut; that there was a greater occurrence and intensity of all the symptoms mentioned in those treated with Narcosan; that there was more marked restlessness and muscular twitching, and particularly a greater intensity in vomiting, diarrhea, cramps, and in general, prostration. In short, symptoms occurring in patients receiving Narcosan were more severe than in those not receiving Narcosan; and there was no advantage shown in recuperation after the withdrawal period of those receiving Narcosan.

That record could be duplicated in essentials with reference to many so-called cures for morphine addiction, and the Council cannot accept any study in which careful controls are not conducted; and it cannot accept a study of a small number of cases, even with satisfactory controls.

The Council authorized publication of this report declaring Rossium unacceptable for New and Nonofficial Remedies.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

CELLU SLICED PINEAPPLE PACKED IN WATER WITHOUT ADDED SUGAR OR SALT

Distributor.—The Chicago Dietetic Supply House, Inc., Chicago.

Packer.—Hawaiian Pineapple Company, Ltd., San Francisco.

Description.—Canned cooked sliced Hawaiian pineapple packed in water without added sugar or salt.

Manufacture.—The method of manufacture is essentially the same as for Doles 1, 2 and 3 Hawaiian canned pineapple products (THE JOURNAL, April 8, 1933, page 1106), with the exception that the fruit is packed in water.

Analysis (submitted by distributor).—

	per cent
Moisture	86.5
Total solids	13.5
Ash	0.4
Fat (ether extract)	0.1
Protein (N × 6.25)	0.3
Total sugar as invert sugar	10.8
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	11.5
Titratable acidity as citric acid	0.9
*p*H	3.4

Calories.—0.5 per gram; 14 per ounce.

Claims of Distributor.—For diets in which sweetened fruit is proscribed.

COFLO—McMATH PROCESS PARTIALLY DEFATTED COOKED COTTONSEED FLOUR

Manufacturer.—Traders Oil Mill Company, Fort Worth, Texas.

Description.—Partially defatted, cooked, pulverized, dehulled cottonseed.

Manufacture.—Selected cottonseed obtained from the cotton gins is further delinted and hulled. The decorticated seeds are pulverized and are cooked in a definite quantity of water for from seventy to ninety minutes in steam jacketed cookers. During the last ten minutes the moisture level is reduced to 12 per cent. The temperature during the first fifteen minutes is rapidly raised to 102 C. and subsequently gradually to 108 C. The cooked material is defatted in hydraulic presses to about 9 per cent fat content; the resulting cake is ground and the flour separated by air flotation.

The temperature and moisture are controlled in the manufacturing process to convert the gossypol content to a nontoxic form.

Analysis (submitted by manufacturer).—

	per cent
Moisture	5.5
Ash	6.0
Fat (ether extract)	9.4
Protein (N × 6.25)	50.0
Crude fiber	2.1
Carbohydrates other than crude fiber (by difference)	26.0

Calories.—3.9 per gram; 111 per ounce.

Vitamins.—Biologic assay shows the flour to be a good source of vitamin B.

Differences Between Gossypol from Raw and Processed Cottonseed Flours and Nontoxicity of Gossypol of Processed Cottonseed.—

1. Absorption spectrum readings taken across the visible part of the spectrum of recrystallized dianiline gossypol prepared from the ethyl ether extract of the raw and processed cottonseed flours are distinctly different and individual.

2. Recrystallized dianiline gossypol prepared from raw cottonseed flour is readily distinguishable crystallographically from that prepared from the processed cottonseed flour.

3. Feeding tests with guinea-pigs and white rats show that the processing inactivates any toxic materials that may be present in the raw cottonseed.

4. Clinical tests in which twenty-five nurses and two doctors in a hospital were fed 60, 30 and 20 Gm. daily for eight weeks showed that the processed cottonseed flour was well tolerated with no untoward effects.

Claims of Manufacturer.—Rich in high quality protein, and a good source of vitamin B. Free from toxic form of gossypol.

LULLABY

Distributor.—Milk Foods, Inc., San Francisco.

Manufacturer.—Golden State Co., Ltd., Newman, Calif.

Description.—Sterilized, concentrated, homogenized mixture of milk, cream, dextrose and lactose.

Manufacture.—Milk and cream from state accredited dairies are mixed in definite proportions and heated. Lactose and dextrose are added in definite quantities. The mixture is pasteurized at 88 C., concentrated under vacuum to the desired percentage of solids, homogenized, cooled, automatically canned and processed to sterility at 117 C.

Analysis (submitted by distributor).—

	per cent
Moisture	62.1
Total solids	37.9
Ash	1.1
Fat (ether extract)	10.5
Protein (N × 6.38)	5.2
Carbohydrates (by difference)	21.1
*p*H	6.4

Calories.—2.0 per gram; 57 per ounce.

Claims of Distributor.—A liquid food for infants deprived of breast milk, to be fed under the direction of a physician. Diluted with two volumes of water, it resembles human milk in percentages of fat, protein, carbohydrate and total minerals (ash).

CHIPPEWA FREE RUNNING SALT

Manufacturer.—The Ohio Salt Company, Wadsworth, Ohio.

Description.—Table salt containing added magnesium carbonate (1 per cent).

Manufacture.—Salt brine is treated with sodium carbonate largely to precipitate out calcium and magnesium salts. Insoluble matter is allowed to settle out, the brine is filtered and is evaporated under vacuum, and the crystallized salt is separated, dried, screened, admixed with magnesium carbonate (1 per cent by weight) and automatically packed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	trace
Calcium sulphate	0.8
Calcium chloride	0.06
Magnesium carbonate	1.0
Sodium chloride (by difference)	98.1

Claims of Manufacturer.—For all table and cooking uses. The added magnesium carbonate tends to preserve "free running" qualities.

(1) COLONIAL WHEAT BREAD
(2) COLONIAL WHEAT BREAD AND WHITE BREAD, SLICED

MADE OF WHOLE WHEAT FLOUR AND WHITE FLOUR

Manufacturer.—Colonial Baking Company, Cedar Rapids and Des Moines, Iowa.

Description.—(1) Sliced and unsliced wheat bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from water, whole wheat flour, flour, sucrose, powdered skim milk, yeast, salt, lard and a yeast food containing calcium acid phosphate, ammonium sulphate, sodium chloride, potassium bromate, potassium iodate, corn starch and malt. (2) Combination package of Colonial White Bread and Colonial Wheat Bread, sliced.

JUNKET POWDER. CARAMEL FLAVOR

Manufacturer.—Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.

Description.—Dessert powder containing sugar, caramel, calcium glycerophosphate, vegetable gum, true maple concentrate, and the Junket enzyme.

Manufacture.—The method of preparation is the same as described for Junket Tablets (Not Sweetened or Flavored) and Junket Powder (With Sugar and Flavor) Vanilla, Chocolate, Lemon, Orange, Raspberry and Coffee Flavors (THE JOURNAL, Sept. 30, 1933, p. 1076).

Analysis (submitted by manufacturer).—

	per cent
Moisture	0.5
Ash	2.0
Fat (ether extract)	0.1
Protein (N × 6.25)	0.1
Sucrose	96.8

Calories.—3.9 per gram; 111 per ounce.

RELIANCE COFFEE

Manufacturer.—Reliance Pure Foods, subsidiary of National Grocery Company, Seattle, Wash.

Description.—Coarse ground roasted coffee.

Manufacture.—Green American, Hawaiian and African coffees are cleaned, blended, roasted under automatic heat control, chilled, ground, and mechanically packed in glass jars, which are sealed under "vacuum."

Analysis (submitted by manufacturer).—

	per cent
Moisture	3.6
Soluble solids	21.5
Ash	3.6
Petroleum ether extract	15.6
Total nitrogen	2.1
Reducing sugars as invert sugar	0.5
Sucrose (copper reduction method)	1.4
Caffeine	1.4
Crude fiber	15.9
Total acidity	4 cc. 0.1 N alkali per gram of coffee.

Claims of Manufacturer.—Sealed in "vacuum" to retain freshness and flavor.

(a) GRIDLEY FAST FROZEN VANILLA ICE CREAM
(b) GRIDLEY FAST FROZEN CHERRY ICE CREAM
(c) GRIDLEY FAST FROZEN MAPLE NUT ICE CREAM
(d) GRIDLEY FAST FROZEN MINT ICE CREAM
(e) GRIDLEY FAST FROZEN PEACH ICE CREAM
(f) GRIDLEY FAST FROZEN PISTACHIO NUT ICE CREAM
(ADDED ALMOND FLAVOR)
(g) GRIDLEY FAST FROZEN STRAWBERRY ICE CREAM

Manufacturer.—Gridley Dairy Company, Inc., Milwaukee.

Description.—(a) Prepared from a pasteurized homogenized mixture of evaporated milk, sweet cream (26 per cent), sucrose, egg yolk, vanilla extract and gelatin. Contains not less than 13 per cent milk fat.

(b) Same as (a) with added cherries and sugar.

(c) Same as (a) with added maple syrup and pecan nuts.

(d) Same as (a) with added mint emulsion prepared from U. S. P. oil of peppermint, glycerin and U. S. Department of Agriculture certified color.

(e) Same as (a) with added fresh peaches and sugar.

(f) Same as (a) with added pistachio nuts, almond extract and U. S. Department of Agriculture certified color.

(g) Same as (a) with added frozen strawberries, sugar and U. S. Department of Agriculture certified color.

Manufacture.—Formula quantities of the ingredients of the basic ice cream are mixed, pasteurized by the holding method at 66 C. for thirty minutes, homogenized, cooled to 4 C., stored in brine-jacketed glass-lined storage tanks and held at 0 C. After twenty-four hours the mix is drawn into ice cream freezers, frozen at —6 C. and automatically packaged. The packaged ice cream is hardened at from —34 to —45 C.

Brick ice cream is automatically packed in waxed paper, bulk ice cream in cleaned cans. The ice cream is transported in refrigerated trucks (—16 to —21 C.).

The various types of ice cream are prepared by adding appropriate flavors, fruits, nuts, etc., in definite proportions to the basic ice cream mix.

Analysis (submitted by manufacturer).—

Vanilla Ice Cream	per cent
Moisture	60.0
Total solids	40.0
Ash	0.9
Fat	13.9
Protein (N × 6.38)	3.9
Carbohydrates by difference (essentially lactose and sucrose)	21.3
	per cent of fat
Maple Nut Ice Cream	13.4
Mint Ice Cream	13.5
Pistachio Nut Ice Cream	13.6
Strawberry Ice Cream	11.4

Calories.—2.3 per gram; 65 per ounce.

NUTRIVOID FLOUR

Manufacturer.—Nutrivoid Products Sales Company, Jersey City.

Description.—Powdered selected white portions of ivory nut (Phytelephas macrocarpa).

Manufacture.—Selected white portions of the ivory nut are ground to a flour, screened, and packed in cans.

Analysis (submitted by manufacturer).—

	per cent
Moisture	8.2
Ash	1.2
Fat (ether extraction method)	0.9
Protein (N × 6.25)	4.3
Crude fiber	6.4
Unavailable carbohydrates other than crude fiber (by difference) (essentially mannan, 92.5 per cent, and pentosans, 2.5 per cent*; starch and dextrins absent *)	79.0

* Journal of Agricultural Research **7**: 301, 1916.

Calories.—0.3 per gram; 9 per ounce.

Claims of Manufacturer.—A special purpose food for diets restricted in dextrose formers yielding 1.7 Gm. of dextrose per hundred cubic centimeters. Contains little food value. High in indigestible material.

CELLU JUICE-PAK STRAWBERRIES

PACKED IN UNDILUTED JUICE WITHOUT ADDED SUGAR

Distributor.—The Chicago Dietetic Supply House, Inc., Chicago.

Packer.—Eugene Fruit Growers Association, Eugene, Ore.

Description.—Processed, stemmed strawberries, packed in undiluted juice without added sugar.

Manufacture.—Ripe strawberries are placed in small containers to prevent crushing, conveyed to the factory, stemmed, graded according to size, inspected for removal of foreign material, spray washed, packed into cans and covered over with undiluted juice expressed from other strawberries. The treatment thereafter is essentially the same as for Cellu Juice-Pak Red Raspberries (THE JOURNAL, May 4, 1935, p. 1606).

Analysis (submitted by distributor).—

	per cent
Moisture	89.8
Ash	0.4
Fat (ether extract)	0.8
Protein (N × 6.25)	1.0
Reducing sugars as invert sugar	5.9
Sucrose	1.2
Crude fiber	0.9
Carbohydrates other than crude fiber (by difference)	7.1

Calories.—0.4 per gram; 11 per ounce.

Claims of Distributor.—Packed in undiluted strawberry juice without added sugar.

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SATURDAY, SEPTEMBER 7, 1935

SPECIFICITY OF STAPHYLOCOCCI

In view of the frequency of acute and chronic staphylococcic infections and the promising results of specific therapy, the recent work of Julianelle and Wieghard [1] is significant. In the first of their series of studies the occurrence of serologic types of staphylococci was investigated. The agglutination reaction, they found, presents an uncertain and inconclusive method for distinguishing immunologic types among the staphylococci. In the determination of immunologic specificity of other bacteria, this property is frequently associated with the polysaccharide fraction of the cell; therefore a similar method was tried with the staphylococci. Precipitation tests were made with a number of purified carbohydrates derived from different strains of staphylococcus. On the basis of precipitation of the purified carbohydrates in antibacterial serums, staphylococci are sharply separable into two distinct types. Nine, isolated from different human infections and therefore considered virulent, fell into one type designated A, and the remaining seven, all isolated from nonpyogenic sources and therefore regarded as avirulent, fell into the second type, called B. While the carbohydrates of type A and type B staphylococcus are precipitated in homologous immune serums, they do not precipitate in antipneumococcus types I, II or III serums or anti-Friedländer types A, B or C serums or in antityphoid serum. It is obvious, therefore, that the carbohydrates are genuinely specific of staphylococcus. It was found possible, furthermore, to employ crude extracts of the bacteria for typing purposes in order to avoid the slow and laborious method of obtaining the relatively purified carbohydrate.

Also the chemical nature of the soluble specific substances was investigated. Chemical differences between type A and type B carbohydrates (probably not chemically pure) were demonstrated. The specific optical rotation of type A was + 6.7, as compared with + 69.4 for type B. Following hydrolysis, type A yielded 26.1 per cent reducing sugars, of which 1.78 per cent was fermentable and 24.32 per cent was nonfermentable. Type B, on the other hand, yielded 38.84 per cent reducing sugars, of which 35.01 per cent was fermentable and 3.87 per cent was nonfermentable. Moreover, the simple sugar of type B seems to be dextrose, while that of type A remained undetermined but suggests, because of its crystalline formation, a different structure. The immunologic specificity of both polysaccharides is dissipated as hydrolysis proceeds.

In the final paper of this group the authors studied the interrelationships of the cell constituents. A study of the antigenicity of the polysaccharides of staphylococcus indicated that, in the condition originally used, they possessed no antigenic properties if the failure to stimulate agglutinins or precipitins in rabbits is accepted as a measure of antigenicity. Acetylation or adsorption of the carbohydrates on collodion particles does not render them antigenic. They may be employed, however, to elicit immediate, type specific skin reactions in patients with staphylococcic infection. In contrast, the protein constituent does evoke an antibody response in rabbits. In hypersensitive persons the protein causes a species specific, delayed, inflammatory skin reaction.

The fundamental investigations reported should find an almost immediate practical application in the use of staphylococcus toxoid in clinical staphylococcic infections. The further usefulness is not yet clear but should be manifold.

1. Julianelle, L. A., and Wieghard, C. W.: The Immunologic Specificity of Staphylococci: I. The Occurrence of Serologic Types, J. Exper. Med. **62**: 11 (July 1) 1935. Wieghard, C. W., and Julianelle, L. A.: II. The Chemical Nature of the Soluble Specific Substances, ibid., p. 23. Julianelle, L. A., and Wieghard, C. W.: III. Interrelationships of Cell Constituents, p. 31.

PRIMARY CARCINOMA OF THE LUNG

The recent literature abounds with references to carcinoma of the lung. Although there is only one reference under the subject of lung cancer in volume 5 (1920) of the *Quarterly Cumulative Index*, there are forty-one in volume 16 (1934). The increasing interest is due to the alleged rising incidence of cancer of the lung and to improvement in surgical technic, which offers a cure of the disease in its early stages. To determine the characteristics and malignant potentialities of different types of carcinoma of the lung, Olson [1] studied sixty-nine cases at the Mallory Institute of Pathology at the Boston City Hospital and classified them on the basis of the microscopic morphology. Investigators have not followed a uniform method in the classification of lung cancers. The older writers divided their cases into tumors arising (*a*) from the epithelium lining the bronchi, (*b*) from the epithelium that is said to line the pulmonary alveoli, and (*c*) from the epithelial cells that form the mucous glands. The more recent writers have suggested a classification of these tumors from a histologic point of view. In 1912 Adler [2] stated that most lung carcinomas were bron-

1. Olson, K. B.: Primary Carcinoma of the Lung: A Pathological Study, Am. J. Path. **11**: 449 (May) 1935.
2. Adler, Isaac: Primary Malignant Growths of the Lungs and Bronchi, New York, Longmans, Green & Co., 1912.

chiogenic in origin. Fried [3] reviewed the subject recently, concluding that all primary lung carcinomas originate from the mucous membrane lining the bronchi. Olson likewise believes that if nonbronchiogenic carcinomas of the lung exist they are rare. He classified histologically into three main groups the sixty-nine cases that came to necropsy: squamous cell carcinomas, adenocarcinomas and undifferentiated carcinomas. The squamous cell carcinomas comprised 42 per cent of the cases, and 28 per cent of them showed the characteristic epithelial "pearl" formation. These tumors were single, gray or white solid masses in 75 per cent of the cases. Multiple masses in one lung were found in only 8 per cent. Areas of tumor necrosis were relatively infrequent. The adenocarcinomas comprised 24 per cent of the entire series. Their chief distinguishing feature was the secretion of mucus and their resemblance to bronchial mucous glands. Since more than half of them showed definite secretory function, this group was subdivided into mucinous and nonmucinous adenocarcinomas. The resemblance of the mucinous type of adenocarcinoma to bronchial mucous glands, and the presence of a mucoid secretion in the alveoli, mark them as a characteristic lung carcinoma. Careful search in the adenocarcinomas nearly always revealed scattered cells in secretory phases, and their metastases in the majority of instances showed mucinous secretion. Grossly, the adenocarcinomas usually appeared as gray, firm, scirrhous tumors with scattered areas of softer yellowish tissue showing visible mucus. Necrosis was uncommon in this group of tumors.

The undifferentiated group of lung cancers was composed of "small cell" tumors, which in the past were often called sarcomas. They have been shown recently by several investigators to be really carcinomas. Of the total series of sixty-nine cases, 33 per cent were of the undifferentiated small cell type. The primary tumor in this group was a mass at the hilus in 65 per cent of the cases, while a secondary or primary bronchus was involved or occluded in 100 per cent. Only 43 per cent of them could be localized by lobes. The entire left lung was infiltrated in 9 per cent and the entire right lung in 4 per cent. The primary bronchi were involved in more than twice as many cases as in either of the other two types of tumors. Grossly, the undifferentiated carcinomas varied from a soft pink mass to hemorrhagic, necrotic and sometimes caseous masses. Necrosis and hemorrhage were prominent in this group.

Metastases from carcinoma of the lung have been reported in practically every part of the body. Among sixty-seven cases in which the body was examined, Olson found somatic metastases in 92 per cent involving forty-five locations in the following order of frequency: the regional nodes, liver, adrenals, vertebrae, kidneys, retroperitoneal nodes, mesenteric nodes and cervical nodes, opposite lung, mediastinal nodes and stomach. The undifferentiated small-cell type of tumor showed the most vigorous tendency to metastasize. In view of the relatively high incidence of lung cancer reported among the Schneeberg miners, it is interesting that in the Boston series pneumoconiosis was found in only 2.9 per cent of the cases. It appears that, in the general population, pneumoconiosis is not an important factor in the production of carcinoma of the lung.

3. Fried, B. M.: Primary Carcinoma of the Lung, Medicine **10:** 373 (Dec.) 1931.

PERPLEXING FEVERS

Immense progress in the understanding of fevers has been made since Galen divided fevers into three main groups: ephemeral, putrid and hectic.[1] While similar meaningless classifications of febrile disturbances appear throughout the writings of later medical men, the number and types of unexplained fevers have been enormously reduced by modern research. Pyrexia of unknown origin may be today the only available diagnosis in some obscure cases, but that cannot excuse its hasty adoption in any case.

Alt and Barker [2] investigated the subsequent histories and fate of 173 patients diagnosed over a period of years at the Peter Bent Brigham Hospital as having unexplained fevers. Of the 101 cases in which follow-up information was obtained, there were seventy-eight in which the cause of fever was never determined. In the majority of these, however, the fever was of less than ten days' duration. In twenty-three a pathologic condition that could account for the fever was later discovered. Tuberculosis, rheumatic infection, malignant disease and sepsis were encountered most frequently in this group.

In 1934 Kintner and Rowntree [3] reported an analysis of 100 cases of long continued, low grade idiopathic fever. This group, like that of Alt and Barker, included more females than males. They believed that the basis for designating this type of fever as neurogenic or psychogenic was insufficient. Neurotic manifestations, however, were pronounced in at least 25 per cent of the cases. Focal infection was present in 35 per cent, and its removal, though often individually helpful, did not much increase the percentage of recoveries. Ultimate discovery of the cause of fever in this group usually was conspicuously lacking.

Douthwaite [4] recently suggested a broad classification of perplexing fevers. His first group is the endocrine, in which the thyroid is the only member that at all frequently gives rise to slight but persistent pyrexia without obvious signs. In the fevers of toxic origin he includes degenerating new growths, cardiac infarctions, alcoholic hepatitis and certain drugs taken to reduce

1. Garrison, F. H.: History of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1929, p. 114.
2. Alt, H. L., and Barker, M. H.: Fever of Unknown Origin, J. A. M. A. **94:** 1457 (May 10) 1930.
3. Kintner, A. R., and Rowntree, L. G.: Long Continued, Low Grade, Idiopathic Fever, J. A. M. A. **102:** 889 (March 24) 1934.
4. Douthwaite, A. H.: Pyrexia of Obscure Origin, Lancet **1:** 1320 (June 8) 1935.

weight. The third group comprises fevers of psychic origin. He believes that the majority of these are fictitious, although some may be legitimate in nervous persons and especially in children. As is well known, the tricks for the production of pyrexia by malingerers are legion. Douthwaite's fourth group, the largest, includes the fevers of microbial origin, which agrees with the observations of Alt and Barker. He places infective endocarditis, staphylococcic infections, food infections and tuberculosis especially high.

Both Douthwaite [4] and Wilson [5] stress the importance of obtaining accurate and painstaking histories in attempting to detect the cause of obscure fevers. The leukocyte count and a rectal examination may often lead to clarification. Wilson adds the agglutination test for undulant fever and, on occasion, roentgen examination of the sinuses. To these diagnostic procedures might be added the need for continued observation of those patients in whom all available measures fail to produce the diagnosis. Greater care in the use of methods now available should lead to a further reduction in the percentage of fevers of unknown origin.

Current Comment

ORAL IMMUNIZATION TO COLDS

For the last two winters, investigators have been studying the efficacy of an orally administered heterophile antigen vaccine in reducing the incidence of the common cold.[1] The strains of common respiratory organisms used in the vaccine were selected for heterophile content and ability to resist the effects of gastrointestinal secretions. The bacterial cultures were sterilized and the bacteria separated, absorbed on starch, dried and finally placed in capsules. The organisms contained in each capsule were: pneumococci, 25 billion; Hemophilus influenzae, 5 billion; streptococci, 15 billion, and Micrococcus catarrhalis, 5 billion. The capsules were administered on an empty stomach daily during the first week and thereafter once or twice a week during the season. The effectiveness seems to have been judged by the average number of colds occurring in the vaccinated group when compared with their average during the preceding three years and with "controls" not taking the vaccine. In the winter of 1933-1934, 1,036 persons were included in the experiment, of which number 500 were given the vaccine. In the succeeding winter 445 were given the vaccine and 469 others served as "controls." The statistics of the second year showed a decrease of 70 per cent in the average number of colds in the vaccinated group as compared with a decrease of 26.3 per cent in the "control" group. Aside from the theoretical objections to oral vaccination for colds, many of which are obvious, there are some specific reasons against the acceptance of this work as adequately controlled. For example, the group taken as controls had, in all instances previous to the experiment, a lower average number of colds per season than the vaccinated group. This factor alone does much to invalidate the control group. Furthermore, in view of the known factors of age, exposure and tremendous variation in colds from season to season and in different locations, any yearly variation in cold morbidity in one location or in small groups is of small utility as scientific evidence. The reports of the therapeutic value of orally administered "cold" vaccines are hardly convincing.

DANGERS OF SLIMMING

Repeatedly and emphatically THE JOURNAL has published statements relative to extraordinary hazards involved in the sudden reduction of weight, occasionally described as banting, slimming, thinning, slenderization and in other ways. From the time when dinitrophenol was first proposed as a product with specific favorable attributes for this purpose, THE JOURNAL warned against its uncontrolled use. This was particularly the case because the product itself is not standardized and because there was hardly sufficient evidence available in the way of long continued study to say what the ultimate effects of the drug might be. Now it appears that one of the ultimate and disastrous effects is in some persons rapidly developing cataracts. Recently the occurrence of such cases was for the first time announced in THE JOURNAL [1] and in this issue several additional cases are reported. Readers will remember records in relationship to the introduction of cinchophen, tetra-ethyl lead, carbon tetrachloride and carbon disulphide as well as many other products used in medicine and in industry in which only long continued observation permitted any final conclusion as to both the virtues and the hazards of the drug concerned. Now comes evidence from many places that in certain instances the long continued use of dinitrophenol is followed by the development of cataract. In occasional cases there are sensitizations which result in eruptions that may be dangerous to life and there are also records of granulocytopenia after taking this drug. The Food and Drug Administration points out that dinitrophenol now forms the basis of a half dozen or more "patent medicines," including one called "Slim," which has been confiscated under the Food and Drugs Act, as well as others called Nitromet, Dinitrolac, Nitra-Phen, Dinitriso, Formula 281, Dinitrose, Nox-Ben-01, Re-Du, Aldinol, Dinitronal, Prescription No. 17, Dinitrole, Tabolin and Redusols. In calling attention to these products Mr. W. G. Campbell, chief of the Federal Food and Drug Administration, says: "It is interesting to note that all the so-called reducing preparations on the market fall into three categories: first, laxatives that deny the body the benefit of its food intake, as the salts, crystals and herb teas; second, obvious frauds that depend for effect upon the stringent diets prescribed as part of the 'treatment,' as

5. Wilson, C. M.: Fever Without Signs, Lancet **2**: 874 (Oct. 17) 1931.

1. Rockwell, G. E.; Van Kirk, H. C., and Powell, H. M.: Oral Immunization to Colds, J. Immunol. **28**: 475 (June) 1935; Further Studies on Oral Immunization to Colds, Science **82**: 177 (Aug. 23) 1935.

1. Boardman, W. W.: Rapidly Developing Cataract After Dinitrophenol, J. A. M. A. **105**: 108 (July 13) 1935. Horner, W. D.; Jones, R. B., and Boardman, W. W.: Cataracts Following the Use of Dinitrophenol, ibid., p. 108.

'Syl-Vette' and 'Stardom's Hollywood Diet'; and third, the unquestionably effective but dangerous articles containing thyroid or dinitrophenol, both of which act by speeding up the utilization of food. All of them are unwarranted impositions upon the public, which cannot evaluate claims made for the preparations and cannot readily appreciate the harm that may result from careless use of the products." His pronouncement is well warranted by the evidence available. For the benefit of the American people, it should be widely circulated through every means of dissemination of information to the public.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Plague-Infected Ground Squirrels.—According to *Public Health Reports*, the director of public health of California reported positive findings for plague in thirty ground squirrels and four wood rats found in Modoc County and received at the laboratory May 8, June 1 and June 13 to 16. The squirrels were found on ranches near Alturas and the wood rats on a ranch near Likely. Eight ground squirrels from the Alturas vicinity received at the laboratory June 17 and one on the 21st were also found positive for plague.

COLORADO

Graduate Course in Ophthalmology and Otolaryngology.—The thirteenth annual summer graduate course in ophthalmology and otolaryngology was held in Denver, July 15-27, under the auspices of the Colorado ophthalmologic and otolaryngologic societies. Physicians giving lectures were:

Hans Barkan, San Francisco, Industrial Accidents.
John Milton Griscom, Philadelphia, External Diseases of the Eye.
Phillips Thygeson, Iowa City, Bacteriology of the Eye.
Edward Jackson, Denver, Causes and Management of Myopia. The Pupil in Vision.
William C. Bane, Denver, Photography of the Eye for Case Record Purposes.
Melville Black, Denver, Ocular Therapeutics.
Donald H. O'Rourke, Denver, Clinical Aspects of Glaucoma.
Ralph W. Danielson, Denver, Recent Advances in Illumination Relative to Visual Comfort and Acuity.
Samuel Iglauer, Cincinnati, Anatomy of the Neck.
Mervin C. Myerson, New York, Suppuration of the Petrous Pyramid.
Robert Levy, Denver, Laryngeal Tuberculosis.
Thomas E. Carmody, Denver, Malignancy of the Mouth and Face.
Frank R. Spencer, Boulder, Recent Advances in Otolaryngology.
George L. Pattee, Denver, Diagnosis of Chronic Maxillary Sinusitis.
Herman I. Laff, Denver, Pathologic Demonstration, Cases of Postanginal Sepsis.
Harold L. Hickey, Denver, Management of Otitic Blood Stream Infections.
Cecil H. Darrow, Denver, Practical Considerations in Peroral Endoscopy.
Harry L. Baum, Denver, Specific Convalescent Serum Treatment in Otolaryngology.

GEORGIA

Annual Registration of Licentiates of State Examining Boards.—The joint secretary, state examining boards, will mail about September 1, to all licentiates of the state board of medical examiners and of other Georgia state examining boards, blanks to enable them to comply with the law requiring annual registration. No fees attach to such registration. Physicians will do well to execute the blanks furnished and to return them to the joint secretary as promptly as possible.

Tuberculosis Work Increasing in State.—More accomplishments were noted in tuberculosis control in the first six months of 1935 than for any other similar period, owing largely, it was stated, to the service rendered by the ten tuberculosis nurses furnished by the Federal Emergency Relief Administration. During this period these nurses made visits to 7,432 families and visited 2,436 cases of tuberculosis, making a total of 16,766 visits to suspected cases, contacts, cases and other persons. In addition to the work done by the nurses, 3,249 tuberculin tests were made by county health commissioners and public health nurses, who organized nineteen clinics and had 1,534 roentgen examinations made by the x-ray unit of the state department of public health. There were 109 clinics held to serve 115 counties, and 7,567 roentgen examinations were made. Of this number, 562 persons were found to have tuberculosis, 389 of whom were white and 173 colored. It was pointed out that, of the 100 new cases brought to notice each month through the tuberculosis control division of the state department, at least 90 per cent need treatment, medical supervision and social service to some degree for a long indefinite period. The disease now holds sixth place among all causes of death in the state. The death rate was 58.9 per hundred thousand of population in 1934, 73.7 in 1931 and 78.5 in 1926.

ILLINOIS

Urge Discontinuance of Shipment of Dogs' Heads by Mail.—The illegal practice of shipping mad dog heads to state diagnostic laboratories in Springfield has grown to such proportions that Dr. Frank Jirka, state health officer, has appealed to the postoffice department in Washington for assistance in discouraging the use of the postal service for this purpose. It was pointed out that it is illegal, hazardous and nearly always worthless to ship dogs' heads by mail to the laboratories for examination for rabies; furthermore, since the heads are not in sealed metal containers, they expose postal employees to infection; not being packed in ice they decompose en route, making it difficult if not impossible for laboratory technicians to determine whether or not the dog was rabid. To date this year 559 heads have been examined, the largest number in several years, while about 1,435 persons have received antirabic treatment.

INDIANA

Society News.—At a meeting of the Vanderburgh County Medical Society, June 25, a resolution was adopted favoring the appointment of a full time health officer for Evansville and Vanderburgh County.——Dr. Carl D. Camp, Ann Arbor, Mich., discussed "Disturbances of Sleep, Insomnia and Hypersomnia" before the Tippecanoe County Medical Society, September 10.

Memorial to Physician.—A portrait of Dr. William J. Bauer, with a bronze memorial tablet, was presented by the Medical Staff Society to the Methodist Hospital, Indianapolis, June 30. It will hang in the resident physicians' office. Dr. Bauer, who died in February during his term as chief resident physician, established the resident physician and intern service in the institution as it now is, according to the Indianapolis Medical Society *Bulletin*. He graduated in 1933 from the State University of Iowa College of Medicine, Iowa City. About 100 physicians attended the ceremony, during which Drs. Edmund D. Clark and John M. Whitehead unveiled the portrait, and John G. Benson, D.D., superintendent, and Dr. Clark paid tribute to Dr. Bauer.

KANSAS

Annual Registration Now Due.—Physicians licensed to practice medicine in Kansas are required to renew their licenses annually, between July 1 and October 1, and to pay a fee of $1 to the secretary of the board of medical registration and examination. The secretary must strike from the register of licensed physicians the names of all physicians who fail to pay their annual registration fees as required by law. Physicians whose names are so removed may be reinstated by paying the secretary $5 and submitting to him satisfactory proof of moral fitness.

MARYLAND

Dr. Hughson Leaves Johns Hopkins.—Dr. Walter Hughson, associate professor of otology at Johns Hopkins University School of Medicine, Baltimore, has resigned to become director of a new otologic research laboratory at the Abington Memorial Hospital, Abington, Pa., near Philadelphia. The new laboratory, which is said to be specially designed for Dr. Hughson, was made possible by a special fund for otologic research at the hospital. Dr. Hughson, who has been teaching at Johns Hopkins since 1920, graduated from the institution in 1918. He will take over his new position in September.

Expedition to South Seas.—Dr. Francis D. Coman, Baltimore, who was medical director of the first Byrd Expedition to the antarctic, chartered a two-masted schooner, the *Kinkajou*, and sailed, July 15, on an expedition to the South Seas. He will gather meteorological and other data for a projected commercial airline to the antipodes. Dr. Coman is on leave from his position as assistant in psychiatry at Johns Hopkins Uni-

versity School of Medicine. A graduate of Johns Hopkins, Dr. Coman has been associated with it since his graduation in 1924. He was medical director of the Byrd expedition from 1928 to 1930 and received the Congressional Medal for his services on that trip.

New Baltimore General Hospital.—The new building for the general division of the Baltimore City Hospitals was dedicated recently with former Governor Albert C. Ritchie presiding. Accommodating 400 patients, the unit is part of a construction program begun at the Baltimore City Hospitals in 1927. This program is financed by a loan of $4,000,000 approved in that year by the state legislature. New units include the nurses' home, which has accommodations for 253 nurses; an addition for chronic patients now under construction, which will care for 240 additional patients; an addition to the tuberculosis building now being erected to care for 134 additional patients, and a power plant. When all the units now under construction are completed and the contemplated changes are made, 2,800 beds will be available; of this number 1,700 will be patients and 1,100 indigent old persons. This number will be reduced by 300 over the next three years as the state gradually takes over the institution's insane patients, in accordance with a plan already worked out. The speakers at the dedicatory ceremony included Dr. Thomas R. Boggs, physician in chief of the Baltimore City Hospitals, who sketched the history of the institution from its inception in 1776 to its present place in the community. The Baltimore City Hospitals, founded in 1865, had its beginning in the old "poorhouse" for care of the indigent. From year to year since that time its other services have been added.

MICHIGAN

State Medical Meeting.—The Michigan State Medical Society will hold its annual meeting at Sault Ste. Marie, September 23-26, under the presidency of Dr. Richard R. Smith, Grand Rapids. The house of delegates will meet Monday afternoon and Tuesday morning. The scientific program will be presented by the following physicians:

Jennings C. Litzenberg, Minneapolis, Maternal Mortality.
John H. Musser, New Orleans, Medical Aspect of Gallbladder Disease.
George W. Hall, Chicago, Relation Between Physical and Psychic Disturbances.
Frederick A. Coller, Ann Arbor, Surgical Aspect of Gallbladder Disease.
Harry L. Huber, Chicago, Allergy and the General Practitioner.
Walter G. Maddock, Ann Arbor, Diseases of Peripheral Arteries—Their Interference with Normal Physiology and Evaluation of Newer Methods of Treatment.
Martin A. Mortensen, Battle Creek, Hypoglycemia in the Vagotonic.
William H. Gordon, Detroit, Compensatory Hypertrophy and Hyperplasia of Islands of Langerhans in Utero; Congenital Hypoglycemia Due to Hyperinsulinism.
Lester M. Wieder, Milwaukee, Common Fungus Dermatoses.
Clyde Emerson Vreeland, Detroit, Achlorhydria—Its Clinical Significance and Management.
Norman F. Miller, Ann Arbor, Common Lesions of the Cervix.
Erwin R. Schmidt, Madison, Wis., Postoperative Oxygen Therapy.

Dr. Smith will deliver his presidential address Wednesday evening, and Dr. Solon Marx White, professor of medicine, University of Minnesota Medical School, Minneapolis, will present the first Andrew P. Biddle Oration, entitled "The Status of the Hypertension Problem." Arrangements are being made for physicians in the southern part of Michigan to attend the meeting on a special boat cruise.

MINNESOTA

Contaminated Wells Closed.—The survey of the water systems of Minneapolis and St. Paul that followed the outbreak of typhoid involving more than 100 cases, has resulted in the closing of twenty-four contaminated wells in various parts of Minneapolis, newspapers stated.

MISSISSIPPI

Personal.—Dr. George F. Carroll has been assigned as chief of surgical service at the Veterans' Administration Facility in Biloxi.

Society News.—The Northeast Mississippi Thirteen Counties Medical Society was addressed in Houston, June 18, by Drs. James B. McElroy, Memphis, on heart diseases; Frank L. McGahey, Calhoun City, toxemias of pregnancy; John G. Lilly Jr., Tupelo, transfusions, and Laurence B. Morris, Macon, empyema; Dr. Jesse T. Davis, Corinth, reported a case of Madelung's deformity.——Dr. Thomas D. Moore, Memphis, discussed the "Conservative Treatment of Surgical Lesions of the Kidney," July 17, before the quarterly meeting of the North Mississippi Medical Society in Holly Springs, and Dr. Edward C. Mitchell, Memphis, spoke on diarrhea.

NEBRASKA

Annual Registration Now Due.—Physicians licensed to practice medicine in Nebraska are required by law to register with the department of public welfare annually, on or before October 1, and to pay a fee of $1. A license expires if the licentiate fails to register, but within the thirty days next following its expiration it may be revived by the payment of the registration fee and a penalty of $1. If that is not done, an order of revocation is issued and thereafter the revoked license can be reinstated only on the recommendation of the board of examiners in medicine and on the payment of the renewal fees and penalty then due.

Annual Clinical Meeting.—The Omaha Mid-West Clinical Society will hold its third annual meeting at the Hotel Paxton, Omaha, October 28-November 1. Guest speakers include the following physicians:

Joseph Brennemann, Chicago, pediatrics.
William B. Carrell, Dallas, Texas, orthopedic surgery.
Arthur B. Cecil, Los Angeles, genito-urinary.
Russell L. Cecil, New York, medicine.
Arthur C. Christie, Washington, D. C., radiology.
Vernon C. David, Chicago, surgery.
James R. Goodall, Montreal, Que., gynecology and obstetrics.
Roy R. Grinker, Chicago, neurology.
Andrew C. Ivy, Chicago, clinical physiology.
Jay Arthur Myers, Minneapolis, tuberculosis.
Edward C. Sewall, San Francisco, eye, ear, nose and throat.
Udo J. Wile, Ann Arbor, dermatology.

NEVADA

Personal.—Dr. George R. Smith has resigned as superintendent of the Nevada Hospital for Mental Diseases, Reno, and Dr. James C. Ferrell, Fallon, has been appointed to succeed him.

NEW JERSEY

Personal.—Dr. Jesse Lynn Mahaffey, Haddonfield, was reelected director of the state department of health for a term of four years. Dr. Irvin E. Deibert, Camden, was elected president of the state board of health.

Joint Meeting.—The Bergen County Medical Society and the Bergen County Pharmaceutical Association will hold a joint session at the Englewood Hospital, September 10. Lloyd K. Riggs, Ph.D., director of research and professor of physiology, New Jersey College of Pharmacy, Rutgers, will discuss "Evaluation of Antiseptics in Modern Practice," and Dr. Albert F. R. Andresen, clinical professor of medicine, Long Island College of Medicine, Brooklyn, "Focal Infection."

NEW MEXICO

British Physicians Visit Indian Village.—Members of the British Medical Association, on their way to Australia to attend the association's annual meeting in September, were greeted in Albuquerque, August 10, by the Bernalillo County Medical Society and taken by motor to Isleta Pueblo, one of the largest Indian villages in the state. In this pueblo is one of the famous old mission churches, erected about 1621, which is considered the seat of the earliest attempt by white men to educate the Indian. After a visit to the pueblo the guests were entertained at a tea before their departure.

NEW YORK

Precipitated Toxoid Ready for Distribution.—Precipitated diphtheria toxoid is now available for general distribution through district supply stations, the state department of health announces. The toxoid will be distributed in small packages for the convenience of physicians and in larger ones for use in clinics and institutions.

New York City

Epidemic May Delay Opening of Schools.—If the outbreak of infantile paralysis in the city continues to increase, the opening of schools may be postponed, it was reported, August 28. With sixty-three new cases reported on this date, the year's total stood at 1,007 cases, with forty-two deaths.

Health Needs of Vagrants.—The New York Emergency Relief Bureau made a health study of 505 persons arrested for vagrancy in the police drive to halt crime in the parks. Of this number 116 were hospitalized, forty-seven for social diseases and fourteen for acute infections. One case of epilepsy was found, one case of tuberculosis and one psychopathic case. Many of the men were found to be in various stages of alcoholism. According to the New York *Times*, the study was carried on for one week in August as a part of the mendicancy project of the relief bureau.

Eighth Graduate Fortnight.—The New York Academy of Medicine will present its eighth annual graduate fortnight, October 21 to November 2, on the general subject "Diseases

of the Respiratory Tract." Eighteen hospitals will present clinics and clinical demonstrations in the afternoons, and evenings will be given over to formal meetings at the academy. Speakers at the evening sessions will be:

Yandell Henderson, Ph.D., New Haven, Conn., Atelectasis, Massive Collapse and Related Postoperative Conditions (the Wesley M. Carpenter Lecture).
Dr. Maximilian A. Ramirez, New York, Allergy in Its Relationship to Diseases of the Respiratory Tract.
Dr. Jonathan C. Meakins, Montreal, Chronic Pneumonitis.
Dr. Charles Hendee Smith, New York, The Pneumonias of Children.
Dr. Charles T. Porter, Boston, Sinus Disease from Infancy to Old Age.
Dr. Charles J. Imperatori, New York, Diseases of the Larynx, Trachea and Main Bronchi.
Dr. Harrison S. Martland, Newark, N. J., Diseases of the Mediastinum.
Dr. Lloyd F. Craver, New York, Tumors of the Lung.
Dr. Leroy U. Gardner, Saranac Lake, N. Y., Pneumoconiosis.
Dr. James Burns Amberson Jr., New York, Bronchiectasis: Types, Diagnosis, Prevention and Treatment.
Dr. Arnold R. Rich, Baltimore, Immunity in Tuberculosis.
Dr. James Alexander Miller, New York, Evolution of Pulmonary Tuberculosis.
Dr. Chevalier L. Jackson, Philadelphia, Bronchoscopy in Its Relation to Diseases of the Respiratory Tract.
Dr. David Riesman, Philadelphia, Emphysema.
Dr. George Blumer, New Haven, Thrombosis and Embolism.
Dr. Harry Wessler, New York, Abscess and Gangrene.
Dr. Alphonse R. Dochez, New York, The Common Cold.
Dr. Henry T. Chickering, New York, Influenza of the Respiratory Tract.
Dr. Adrian V. S. Lambert, New York, Surgery of Tuberculosis of the Chest.
Dr. Howard Lilienthal, New York, Chronic and Subacute Empyema.

A comprehensive exhibit with demonstrations at regular intervals will also be part of the program.

NORTH CAROLINA

Personal.—Dr. Clarence H. White, Kenansville, has been made district health officer, with jurisdiction over the health boards of Avery, Yancey and Watauga counties.——Dr. Alfred D. Gregg, Liberty, has been appointed health officer of Edgecombe County to succeed Dr. Rembert E. Broadway, Tarboro, who resigned to engage in private practice. Dr. George H. Sumner, Asheboro, has been appointed health officer of Randolph County to succeed Dr. Gregg.

OHIO

Meeting at Marion.—At a meeting of the Northwestern Ohio Medical Association, September 24, in Marion, speakers will be:

Dr. Henry H. Ritter, New York, Ambulatory Treatment of Fractures.
Dr. Harold Feil, Cleveland, Changing Trends in Heart Disease.
Dr. Rupert Franklin Carter, New York, Appendicitis in Children.
Dr. William H. Gordon, Detroit, Malignant Neutropenia.
Dr. Henry Schmitz, Chicago, Cancer.

At a public meeting in the evening, Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will give an address on "Medicine in the Changing Social World."

OKLAHOMA

Personal.—Dr. Dock Long, Duncan, has been appointed health superintendent of Stephens County, and Dr. James E. Jones, Hollis, of Harmon County.——Dr. Perry J. Cunningham, Afton, has been named physician of Ottawa County; he will reside in Miami after September 1.——Dr. George N. Bilby, former state health commissioner, has reentered the practice of medicine at Alva.

Committee to Standardize Institutions for Crippled Children.—A standardization committee has been appointed and a state commission for crippled children created under a law that went into effect July 1. The standardization committee, composed of Drs. Maurice J. Searle, Tulsa, Earl D. McBride, Oklahoma City, William P. Fite, Muskogee, John F. Park, McAlester, and Walter M. Browning, Waurika, will pass on hospitals and convalescent homes in the state qualified to care for crippled children. The commission for crippled children will consist of the state superintendent of health as chairman, the dean of the medical school and the state superintendent of public instruction, and will probably be designated to handle the federal grant for crippled children. The hospitals of the state have been divided into four classes, according to the type of case handled: crippled children's hospital, general hospital, standard hospital and convalescent homes. To be approved, each institution must conform with certain standards. The amended crippled children's law now provides for medical and surgical treatment and hospital and convalescent care for children who are afflicted with any malady or deformity that can be remedied, whose parents are unable to provide it for them. Formerly this care was provided for in state institutions, but now the state will pay for this care in any institution approved by the committee on standardization.

OREGON

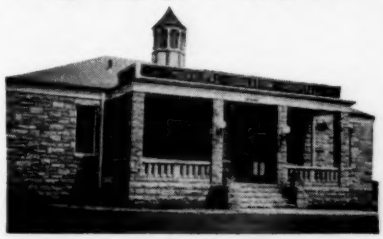
State Medical Meeting at Gearhart, September 19-21.—The sixty-first annual session of the Oregon State Medical Society will be held at the Hotel Gearhart, Gearhart, September 19-21. Out-of-state speakers will include Drs. Hubbard T. Buckner, Seattle, "Treatment of Supracondyloid Fractures of the Elbow," and Hans Lisser, San Francisco, "Pituitary-Adrenal Relationships." In addition to a symposium on common errors responsible for maternal mortality by Drs. Raymond E. Watkins, Virgil E. Dudman, Goodrich C. Schauffler and Theodore W. Adams, all of Portland, the following physicians will speak:

Paul H. Nitschke, Portland, Causes and Treatment of Urinary Retention.
Thomas D. Robertson, Portland, An Analysis of Fatal Thrombotic Pulmonary Embolism.
Roy C. McDaniel, Portland, Eradication of Hernia by Injection.
George W. Millett, Portland, Significance of Gastro-Intestinal Hemorrhage.
Lorenzo D. Inskeep, Medford, Etiologic Factors in So-Called Idiopathic Epilepsy.
Millard S. Rosenblatt, Portland, Goiter: Interesting Practical Points.
Arthur C. Jones, Portland, Diathermy and Short Wave Radiothermy.
Otis B. Wight, Portland, Plans of the State Cancer Committee and Fundamentals of Cancer.
James C. Hayes, Medford, Torsion of the Testis.
Banner R. Brooke, Portland, Phases of Rectal Pathology.
James Marr Bisaillon, Portland, Differential Diagnosis of Thoracic Disease.
Eugene W. Rockey, Portland, Problems of the Physician and the State Industrial Accident Commission.
Samuel G. Henricke, Portland, Preventive Medicine in Private Practice.

Dr. Lisser will also give a lantern slide clinic on endocrine disorders. The annual banquet will be Friday evening, when the presidential address will be given, and the ninth annual golf tournament will be held Saturday afternoon. The prizes will be awarded at a dinner that evening.

PENNSYLVANIA

County Society Operates Contagious Disease Hospital.—The Municipal Isolation Hospital of Johnstown, a new seventy-five bed institution owned by the city and operated by the Cambria County Medical Society, was dedicated June 14. This hospital was founded in 1902 in a tent. The next year a rough building was erected as an isolation camp during an epidemic of smallpox. A few years later convalescent patients partly finished the interior and the building remained in that condition until 1928, when the county medical society took it over, with Dr. Henry W. Salus as director. It has now a staff of fourteen physicians. After several years' efforts, funds were acquired for the new building, which was begun in November 1934. It is a one-story structure of cut stone and covers a fourth of a city block. At the dedication in June a bronze tablet was presented to Dr. Salus by the directors and the staff in recognition of his work in building up the hospital.



Isolation Hospital

TENNESSEE

Personal.—Dr. Edward A. Guynes has been named chief of staff of the Knoxville General Hospital to succeed Dr. Andrew Smith, who was recently made superintendent of the hospital.——Dr. Perry Priest has resigned as medical superintendent of the Tennessee Home and Training School for Feebleminded Persons at Donelson, and Dr. Oscar S. Hauk of the staff of the Central State Hospital at Nashville has been appointed to succeed him.——Dr. Hilton R. Carr, Memphis, has resigned as superintendent of the Shelby County Hospital to enter private practice.——Dr. Bernard W. Patton, Lebanon, was recently made health officer of Wilson County to succeed Dr. William D. Cagle.

Society News.—At a meeting of the Hardin, Lawrence, Lewis, Perry and Wayne County Medical Society, July 30, Drs. Joseph P. Gilbert discussed mental disease; Milton Smith Lewis, Nashville, diagnosis and management of the occipito-posterior position, and Eli H. Etheridge, Loretto, diagnosis of cancer of the lungs.——The Washington County Medical Society was addressed in Johnson City, July 11, by Drs. Cassius W. Friberg on toxemias of pregnancy, and Lee K. Gibson, appendicitis.——The Black Patch Medical Society was

addressed by Drs. Murray B. Davis and William H. Witt, Nashville, on treatment of burns and symptoms of diseases, respectively.

WEST VIRGINIA

Dr. Simpson Retires as Dean.—Dr. John N. Simpson, dean of the medical faculty of West Virginia University School of Medicine since he organized it in 1902, has retired with the title of dean emeritus, and Dr. Edward J. Van Liere, since 1922 professor and head of the department of physiology, has been named acting dean. Dr. Simpson is 66 years of age. He was professor of physiology at the school from 1902 to 1920, since which time he has been professor of medicine, and director of the hygiene laboratory of the state department of health from 1913 to 1917. He graduated from the Johns Hopkins University School of Medicine in 1902. The West Virginia University School of Medicine, which offers only the first two years of the medical course, is now being reorganized (THE JOURNAL, August 24, p. 606).

WISCONSIN

Bequest for Cancer Therapy.—Columbia Hospital, Milwaukee, has received a bequest of $7,000 from the estate of the late Mrs. Sarah A. Spalding to finance a new department for treatment of cancer by high voltage roentgen therapy. Two rooms have been set aside for the new department, in which a high voltage x-ray machine is to be installed. Dr. Silvanus A. Morton will be in charge.

Cancer Clinics.—Six clinics on cancer were conducted in different parts of the state of Wisconsin, July 8-13, under the auspices of the Wisconsin State Medical Society, the University of Wisconsin Medical School and the American Society for the Control of Cancer. The clinics were held by Drs. Ellis Fischel, St. Louis, William P. Healy, New York, and Frank L. Rector, Evanston, Ill., to demonstrate new methods of diagnosis and to present to the general practitioner the latest data on prevention and cure of cancer. A public lecture was given after each clinic.

Society News.—Drs. William E. Bannen and James A. Evans, La Crosse, addressed the Barron-Sawyer-Washburn Counties Medical Society, Rice Lake, June 4, on "Urologic Pathology in General Practice" and "Heart Failure and Treatment," respectively.——Dr. Owen C. Clark, Oconomowoc, addressed the Waukesha County Medical Society, Waukesha, June 5, on agranulocytosis.——The Fifth District Medical Society held its annual meeting at Sheboygan, July 11, with the following speakers: Drs. Samuel F. Haines, Rochester, Minn., "Medical Aspects of Thyroid Disease"; Elmer L. Sevringhaus, Madison, "Diagnostic and Therapeutic Problems of the Menopause"; Arlie R. Barnes, Rochester, "Coronary Sclerosis," and Ralph M. Carter, Green Bay, "Orthopedic Conditions of Interest to the General Practitioner." Dr. Gilbert E. Seaman, superintendent, Northern Hospital for the Insane, Winnebago, made an address at a banquet in the evening on "Problems in the Care of the Mentally Ill."

GENERAL

Medical Facilities on the Normandie.—Two hospital units of thirty-five beds each for passengers and crew are a part of the equipment of the new French liner *Normandie*. Dr. Joseph Bohec, Paris, is ship surgeon, assisted by two physicians and seven nurses. The medical equipment includes physical therapy apparatus, a radiology room and an apothecary shop. There is also a fully equipped medical and surgical clinic.

Examination in Obstetrics and Gynecology.—The American Board of Obstetrics and Gynecology announces that the next written examination and review of case histories of group B applicants for certification will be held in various cities in the United States and Canada, December 7. Application blanks and further information may be obtained from Dr. Paul Titus, secretary of the board, 1015 Highland Building, Pittsburgh (6), Pa. Applications must be filed not later than November 1.

Prevalence of Infantile Paralysis.—Seventeen new cases of infantile paralysis reported in Virginia, August 19, according to the newspapers, brought the total in the state since the first of the month to 202. Twenty-two new cases, August 27, brought the total in Massachusetts for the month to 408. Fifty-nine cases were reported to the New Jersey Department of Health between July 1 and August 21. As a precautionary measure in Grand Rapids, Mich., wading pools have been closed and children up to 11 years of age have been barred from swimming pools in the city. The health officer of Bay City, Mich., and the Bay County Medical Association have jointly asked for the donation of blood by persons who have recovered from the disease, the contributions to be used for serum treatment of active cases. Playgrounds and theaters in Wyandotte were ordered closed to children under 17, and three boys' camps in the state have been closed. In Louisville, Ky., there have been thirty-eight cases, with two deaths.

Tuberculosis Mortality Lower.—A study of the tuberculosis death rate in forty-six large cities in 1934, recently issued by the New York Tuberculosis and Health Association, indicates that the rate for the whole group is 4 per cent lower than the 1933 rate, 69.6 per hundred thousand as compared with 72.5. Sixteen cities showed increases, however, as follows: Denver 3 per cent, Cleveland 3, Buffalo 3, Minneapolis 8, Cincinnati 2, Indianapolis 3, Houston 6, Rochester, N. Y., 18, Columbus 15, Oakland, Calif., 12, Atlanta 16, Akron 3, Syracuse 3, Omaha 39, Paterson 7, Elizabeth 21. New York, Chicago, Detroit and Los Angeles showed decreases, and Philadelphia's rate did not change. Dallas showed the greatest decrease, 25 per cent. Akron, Ohio, had the lowest rate, 35, and San Antonio the highest, 145. A separate compilation of Negro deaths showed a rate of 220.9 per hundred thousand among Negroes, a reduction of 5 per cent from 1933. The white death rate was 56. These figures include deaths of residents out of town whenever they were known.

Life Expectation in Rural Areas Greater.—Figures relating to the white population of the United States for 1930, recently made available by the Metropolitan Life Insurance Company, reveal that the rural dweller has, on an average, four or five years longer life than the urban resident. At birth, a white male has an expectation of life of 56.73 years if an urban resident and of 62.09 years if dwelling in a rural section. The corresponding figures for a white woman are 61.05 and 65.09. The figures cited are not adjusted for deaths of rural inhabitants who die in city hospitals but, broadly speaking, they are characteristic of urban and of rural longevity. The states with especially high expectation of life are typically agricultural, while the typically industrial states are below average or only a little above. New Mexico and Arizona show a very low expectation of life in spite of a low degree of industrialization; however, these states have a high percentage of Mexican population whose mortality is markedly above that of other persons together with whom they have been classified as white.

Control of Compounds of Codeine.—A recommendation that exemption from the import certificate system be allowed to solid compounds containing codeine and ethylmorphine hydrochloride (dionin) only when these drugs are associated with other medicinal substances was brought in by a special subcommittee at the twentieth session of the Advisory Committee on Traffic in Opium and Other Dangerous Drugs of the League of Nations, at Geneva, Switzerland, May 20-June 5. It was also recommended that exemption should not be allowed to liquid compounds consisting of codeine or ethylmorphine hydrochloride in one or more inert fluids. The Opium Advisory Committee at this session recognized that the menace of cannabis is increasing in many countries. Plans were made to build up a library on cannabis in the League of Nations and to develop chemical tests to show the presence of cannabis derivatives by processes suitable for use by police officers. Dr. Walter L. Treadway of the U. S. Public Health Service was appointed to a committee to study the effects of the abuse of cannabis and methods to cure addiction. The views of the United States that dried poppy heads and poppy straw are to be classified as raw material and subject to national and international control were also accepted by the committee.

LATIN AMERICA

Pan-American Congress on the Child.—The seventh Pan-American Congress on the Child will be held in Mexico City, October 12-19, under the auspices of the department of public health. Dr. Abraham Ayala Gonzalez, chief of the health department, is president of the organizing committee, and Dr. Alfonso Pruneda, general secretary. There will be the following seven sections of the congress: pediatric medicine, pediatric surgery and orthopedics, child hygiene, social service, legislation and education. Subjects to be treated in the medical section include rickets, allergic states in children and mucohemorrhagic colitis; in the surgical and orthopedic section, focal infections, paralysis in children and tuberculous osteo-arthritis.

CORRECTION

Diagnosis of Congenital Syphilis.—At the end of the article by Drs. A. H. Parmelee and L. J. Halpern in THE JOURNAL, August 24, page 563, the address of Dr. Halpern should be 6355 Broadway at Devon.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 10, 1935.

The Second International Neurological Congress

The second International Neurological Congress was held in London from July 29 to August 2. It was attended by 677 members from forty-two countries (almost all the civilized countries of the world), about sixty members coming from the United States. The chief officials were Dr. Gordon Holmes, F.R.S., president; Dr. S. A. Kinnier Wilson, secretary general; Dr. Macdonald Critchley and Dr. E. A. Carmichael, assistant secretaries; Dr. Anthony Feiling, treasurer; Dr. Bernard Sachs and Sir C. S. Sherrington, honorary presidents. The congress met in seven sections, for which ample accommodation was provided at University College, and nearly 300 papers were presented. The arrangements were excellent except that the time limit for papers was not always observed, with the result that some papers were crowded out. The mornings were devoted to discussions on selected subjects, which began with a series of papers and then became open. These subjects were "The Epilepsies," "The Physiology and Pathology of the Cerebrospinal Fluid," "The Functions of the Frontal Lobes" and "The Hypothalamus and the Central Representation of the Autonomic System." The afternoons were devoted to miscellaneous papers, which were grouped as follows into the various sessions: Clinical Neurology, Pathology, Physiology, Anatomy, Physiology of the Autonomic System, Clinical Physiology, Intracranial Tumors, Pathology of the Cerebrospinal Fluid, Psychopathology, Diagnostic Methods and Surgical Diseases, Experimental Neurology and Treatment. The member of the congress who attracted most attention was Professor Pavlov. Though an octogenarian, he is still alert. When he got up to speak as well as when he sat down he received an ovation.

THE MOTOR CORTEX IN THE LIGHT OF HUGHLINGS JACKSON'S DOCTRINES

The congress attended a special meeting of the Neurological Section of the Royal Society to hear the lecture in commemoration of the centenary of the birth of Hughlings Jackson, which was delivered by Prof. Otfried Foerster of Breslau. The congress medal bore the effigy of Hughlings Jackson. Professor Foerster said that Jackson was the first to point out the existence of the motor cortex, which he inferred from the experiments performed on the brain by disease before physiologists confirmed his view. The motor functions of the cortex were then unknown and epilepsy was believed to be a manifestation of disorder of the pons and the medulla. Jackson relied on his incomparable power of deductive reasoning. He recognized that epileptic convulsions were a caricature of normal movements and announced the then revolutionary view that the cortical motor cells must be concerned. He believed that no part of the cerebral hemispheres was purely motor or purely sensory and so it has proved, for Professor Foerster by electrical stimulation of the human cortex has shown that, from areas other than the precentral, complex movement and postures can be elicited. Foerster believes that these extrapyramidal motor centers are the source of the relatively cumbersome movements possible in the hemiplegic patient after damage of the pyramidal tract. There was scarcely a neurologic problem that had not been illuminated by Hughlings Jackson's ingenuity. Dr. Sittig of Prague pointed out that Jackson had anticipated Freud in his view of the unconscious, a fact that has previously been unnoticed. Jackson held that when in disease, insanity or dreams the highest cerebral level was put out of function the next lower level became more active. The positive symptoms of insanity thus came out of the unconscious.

PAIN RESULTING FROM PRODUCTS OF METABOLISM OR TISSUE DAMAGE

Sir Thomas Lewis said that because simple physical interferences are apparently capable of stimulating nerves directly there has been a tendency to interpret most pains as a result of physical changes induced in nerve endings directly. This may be true in many instances, but other methods of stimulation are becoming apparent. Evidence has been accumulating which suggests that malnutrition or injury of tissues may so change the local chemical or physicochemical environment of nerve endings as to stimulate them. Thus it seems established that the products of the work of somatic muscle may accumulate in the tissue spaces until they start pain impulses. In the case of injuries to the skin there is definite evidence that substances released from the skin act thus. The idea that sensory nerve endings may be stimulated by natural chemical or physicochemical tissue changes has been taken beyond the stage of theory by the pain produced by the arrest of blood flow to a part.

THE EFFECT OF REMOVAL OF BOTH FRONTAL LOBES

Dr. R. M. Brickner of New York described a unique case in which both frontal lobes were removed for meningioma. Broca's area and the motor cortex were left intact. In all, 116 Gm. of brain tissue was removed. As the amount of damage done to the brain was known with fair exactness, the function of the missing parts in this patient, a man of 44, could be deduced. The changes were of two kinds: (1) intellectual defects, such as impairment of memory; (2) impairment of control over emotional drives, perhaps because he had lost knowledge of the social gain from such control. He became like a child who had not yet learned to adapt himself to the people he must meet in the world. The whole effect might be interpreted as loss of the elaborate association or synthesis into complex structures of the simpler engrammic products associated in the more posterior parts of the brain. It might be described as loss of ingenuity. The indication is that man needs a frontal lobe which can ingeniously comprehend the emotions well enough to control them instead of yielding to them.

THE PATHOGENESIS OF EPILEPSY

Dr. W. G. Lennox of Boston had found that certain alterations of physiologic processes of the brains of epileptic patients modified the frequency of the seizures: 1. Acid-base equilibrium. Alkalosis by overventilation or by ingestion of alkali tended to increase seizures; acidosis induced by fasting, a ketogenic diet, ingestion of acids, breathing carbon dioxide or muscular activity tended to decrease seizures. 2. Cerebral blood flow. The total blood flow through the brain, measured by a thermo-electric recorder, does not show reduction before the seizure except when this is induced by overventilation. Hence general cerebral anemia is not the cause of the seizures. 3. Oxygen. The volume of oxygen consumed between seizures is normal or moderately reduced. Immediately before and during nonconvulsive seizures there is no significant alteration in oxygen consumption. Induction of cerebral anoxemia (by breathing pure nitrogen or ingestion of sodium nitrite) produced an attack in only one out of twenty cases of grand mal, but in petit mal a seizure was constantly produced. 4. Electrical activity of the brain. Petit mal seizures were found to be invariably preceded or accompanied by a burst of electrical potentials about ten times the voltage and about one-fifth the frequency of the patient's usual potentials. Clonic movements were synchronous with these large waves; similar voluntary movements were unattended by differences in electrical potential. The conclusion was that abnormal physiologic states, such as

alkalosis, cerebral anemia or anoxemia, are not the usual causes of seizures but that they may alter the seizure threshold and precipitate seizures in petit mal.

THE SURGICAL TREATMENT OF HYPERTENSION

Dr. Max M. Peet described sixty cases in which operation for hypertension had been performed at University Hospital, Ann Arbor, Mich. He resected the greater and lesser splanchnics and the lower dorsal sympathetic chain (tenth to twelfth ganglions. The operation was done above the diaphragm after resecting the eleventh rib. The blood pressure in all cases was at some time over 200 and it ranged from 210 to 300. Many of the patients had retinal hemorrhages, masses of exudate and papilledema. Severe kidney damage in the absence of high nonprotein nitrogen was not considered a contraindication to operation. Improvement was obtained in 85 per cent, varying from simple relief of headaches to apparently complete cures. Ten per cent were not benefited and about 15 per cent were apparently cured. In some of the latter a blood pressure as high as 285 was reduced to 130-140 over periods ranging from six to seventeen months. A complete return to normal vision and normal kidney function took place.

PARIS

(From Our Regular Correspondent)

July 26, 1935.

Bone-Muscle Syndrome Improved After Parathyroidectomy

Richet and his associates reported a case presenting a curious syndrome at the April 12 meeting of the Société médicale des hôpitaux. A man, aged 27, complained of impotence and complete rigidity of the lower extremities, trunk and neck of seven years' duration. Active and passive efforts to move the affected muscles were impossible owing to the pain during such movements. There was a complete ankylosis of both hips. The muscles, especially of the thighs, felt very hard, having almost the consistency of a board. There was a well marked Chvostek sign, and tic movements of the facial muscles frequently occurred. The tendon reflexes were normal. There was a similar history in the mother of the patient. The blood examination of the latter revealed at times a marked calcium retention, while at other examinations the calcium content of the blood showed a hypocalcemia. All efforts in the form of a diet, low in calcium but rich in acid content, as well as the daily injection of parathyroid extract were of no avail. Biopsy of the muscular tissues revealed an advanced sclerosing myositis. Removal of one of the parathyroids was decided on. The gland was very large, and histologic examination revealed a marked adenomatous change. This operation was followed by disappearance of the pain on movement and of the board-like rigidity of the muscles. The hypercalcemia disappeared and roentgenography revealed a recession of the periosteal proliferations. The patient for the first time in two years is now able to get out of bed and walk. In the opinion of Richet and his associates, the case represents a dysfunction of the parathyroids resulting in an osteoarthritis and a sclerosing myositis.

Innocuity of B C G Vaccine

Negre and Valtis of the Pasteur Institute (Paris), at the May 7 meeting of the Academy of Medicine, reported their observations on fifty-seven infants, who were given the B C G vaccine at birth and kept under observation from 1928 to 1935. It was always possible to isolate tubercle bacilli of the human type from lesions found in infants who had been given the B C G vaccine but who had been raised in an environment in which they were exposed to tuberculous infection. These infants were contaminated in spite of having been vaccinated. This, according to Negre and Valtis, excludes the possibility of a recrudescence of the virulence of the filtrable virus in the B C G vaccine. Bacteriologic examination of the pus from suppurating lymph nodes in twenty-one infants, immunized by the buccal route, gave the following results: In thirteen of the twenty-one, no pathogenic germs were found; in six cases only ordinary pyogenic organisms; in one case (the child had been in contact with a case of virulent tuberculosis) and a second case, only acid-fast bacilli were found the inoculation of which into guinea-pigs failed to result in evidences of tuberculous infection. Eighteen infants who were given the B C G vaccine at birth have died of various intercurrent disorders. At necropsies on these children it has never been possible to find either in the alimentary tract, lymph nodes or solid viscera any virulent strain of tubercle bacilli to which death could be attributed. Thus, in not a single case has it been possible to find that any accidents reported as occurring in infants vaccinated at birth were due to a recrudescence of the virulence of the filtrable virus contained in the B C G vaccine.

Intermittent Hemiplegias Due to Spasm of Cerebral Vessels

Tinel and Pottier call attention in a paper published in *La pratique médicale française* to a form of transitory hemiplegia not infrequently observed in apparently normal young persons in whom there is no evidence of syphilis or of arterial changes, such as hypertension or sclerosis, as well as absence of uremia or cardiac disease. The only way such cases can be explained is that they are due to a vascular spasm. Such an explanation may suffice for intermittent, transitory hemiplegia that is observed in cases of cerebral tumors, syphilis of the central nervous system and atheroma. These temporary hemiplegias occur more commonly than has been generally supposed.

Does Tracheobronchial Adenopathy Exist in Children?

Lestocquoy in the May 5 issue of the *Concours médical* answers negatively, so far as a nontuberculous infection is concerned, whether tracheobronchial adenopathy really exists in children. The only conditions under which one encounters such nontuberculous enlargements of the tracheobronchial lymph nodes is in Hodgkin's disease, lymphosarcoma and mediastinal tumors. In tuberculosis the adenopathy never occurs alone but is accompanied by pulmonary lesions. Tuberculosis of the lymph nodes at the hilus is found in three forms:

1. Caseation of the bronchial lymph nodes during the first year of life. The concomitant pulmonary lesions are usually minimal. When the lymph nodes are very large and the pulmonary lesions small, the prognosis is not favorable. The diagnosis is based on the stridor and a "bitonal" cough accompanied by loss of weight and appetite and a positive skin reaction. Radiography is the best diagnostic method and enables one to see a convex contour on each side of the trachea or a dark band of right sided parasternal shadow. These cases frequently terminate in meningitis or a generalized miliary tuberculosis.

2. Enlargement of the bronchial lymph nodes of young children. This occurs associated with adjacent small pulmonary tubercles. It should be looked for in all children who have a positive skin reaction. Here radiography is virtually the only method of diagnosis, because percussion is unreliable. One sees the juxtatracheal, juxta-aortic and, in profile, real mediastinal shadows. The prognosis is more favorable than in the first group. Many of these nodes seem to disappear gradually under appropriate treatment.

3. Calcification of the bronchial lymph nodes. This is the most typical group and is observed in older children who are fretful and poorly nourished and who have at intervals slight febrile attacks. The physical examination is not of much aid; the condition exists almost without any clinical signs. The radiologic observations, however, are typical, in the form of uniformly dark shadows at the pulmonary hili, surrounding the bronchi. In spite of representing an apparently healed lesion,

these calcified nodes represent a latent stage of tuberculosis, from which virulent bacilli frequently enter the circulation in adolescents and adults. From these peribronchial lymph node foci arise the pulmonary lesions in the majority of cases.

BERLIN

(From Our Regular Correspondent)

July 8, 1935.

Popular Medicine in Germany

The nature cure movement, which under the new régime in Germany receives strong support, was recently given a new impetus toward a wider development. From May 12 to May 26 an exposition of German popular medicine, which enjoyed the protection of the district leader Julius Streicher, was held in Nuremberg. The protracted session brought together the supporters of all trends and groups representing "popular medicine" and "life reform" and resulted in an enthusiastic demonstration. That in this movement political and so-called racial points of view play a great part is well known. Researches into the family histories of leading German investigators with a view to discovering a strain of non-Aryan blood in their ancestry are now popular, the ultimate aim being to discard rational scientific methods in the treatment of disease (syphilis, for example) and to substitute hydrotherapy and herbal treatment, homeopathy and the like. The movement claims to have 12,000,000 adherents in Germany, and almost a million families organized in the "gesundheitsvereine," or health clubs. The demonstration culminated in the Reichstagung der Deutschen Volksheilbewegung, at which Dr. Wagner, the present fuehrer of German medicine, gave several speeches in which he outlined programs for the future of German medicine. The most significant thing about the session, as the official *Deutsches Aerzteblatt* points out, is the fact that in Nuremberg the foundation was laid for the creation of a new comprehensive system of German medicine that will include both trends, scientific medicine and nature cure practice. In the addresses and papers the well known points of attack on "old school" medicine were again brought out—in some instances by physicians themselves. Thereupon the fuehrer of German medicine announced in a special ceremony the creation of the Reichsarbeitsgemeinschaft der Verbände für naturgemässe Lebens- und Heilweise and of the Reichsarbeitsgemeinschaft für eine neue deutsche Heilkunde. The last mentioned merger will take upon itself the task of providing training in the new system of medicine and of creating suitable chairs at the universities. Leadership in the new movement was entrusted to Dr. Kötschau, professor of nature cure practice at the University of Jena. The merger first mentioned, that for nature cure and the natural mode of living, is designed to bring together the lay groups that support the movement and to strengthen among the people their understanding for biologic therapeutic methods. With this merger will be affiliated the Biochemischer Bund Deutschlands, the Felke-Bund, the Reichsbund für Homöopathic, the Kneipp-Bund, the Deutsche Gesellschaft für Lebensreform, the Priessnitz-Bund, and the Schüssler-Bund der Biochemiker. The character of the constituent elements reveals the nature of the task proposed. The following citation from an address of the fuehrer of German medicine illustrates his point of view: "A materialistic age was so arrogant as to imagine that the eternal secrets of life may be fathomed with the aid of the exact natural sciences alone. . . . One must not suppose that in a period of so great mental storm and stress such as we are passing through the great revolution will stop short before the gates of the German universities or before the barriers erected by their scientists. . . . The foundation for the new system of medicine cannot be the exact natural sciences but only the national-socialist world views concerning the natural and fundamental biologic 'laws' controlling all events. . . . It is by no means part of our conception that the old school medicine should be entirely rejected or that the technical acquisitions that it has brought us should be renounced. . . . It is our aim to effect a synthesis of the onesided old school medicine and the nature cure methods. We turn aside from the extremists and fanatics of both camps. . . ." In spite of all the agitation there was until recently no clinic for nature cure medicine at any German university; but now the Faculty of Medicine of Erlangen has decided to establish such a clinic and to create in association with it a professorial chair.

In addition, the Reichsarbeitsgemeinschaft der Naturärzte (merger of nature cure practitioners) has been created, with which a number of leagues have become affiliated, their character indicating plainly the nature of the merger; for example, the Deutsche Allgemeine Aerztliche Gesellschaft für Psychotherapie, the Deutsche Gesellschaft für Bäder- und Klimakunde, the Zentralverein Homöopathischer Aerzte, the Bund der Kneipp-Aerzte, the Reichsverband der Naturärzte and the Vereinigung Anthroposophischer Aerzte. According to a published utterance of the director of this merger, the nature cure practitioner is helping the German people to bridge the gap to the German physician of the future. In an address before this new merger, Professor Kötschau proclaimed that biologic medicine achieves success in some cases in which old school medicine is at a loss what to try next. He stated further that biologic medicine is ready to show that it possesses effective weapons with which to combat epidemics successfully. It opposes the lack of confidence in and the distortion of nature, which find their expression in exaggerated sterilization, conservation and disinfection measures. It is interesting to note that as eminent a clinician as Professor von Krehl of Heidelberg has expressed his views on nature cure medicine not only in an address before the Heidelberg Medical Society but also in an article in *Therapie der Gegenwart*. While he makes a number of concessions to nature cure medicine, he endeavors, on the other hand, to defend old school medicine, of which he has been, in a sense, an exponent for thirty years or more. He admitted that he had been unable fully to understand the standpoint of the representatives of nature cure medicine in their attitude toward medicines. He had observed that, in adducing proof, it was always certain prominent nature cure practitioners who were cited. Of the mediocre practitioners little or nothing is heard; particularly the many patients who fail to receive any benefit are silent on the subject. It had been his experience that persons of a very definite type, from the standpoint of disease and personality, are adapted to the application of nature cure methods. Patients of this type are sometimes cured by nature cure practitioners after regular physicians have failed. It is evident that suggestion plays an important part in such cases. But that any patient with a grave organic disease had been cured in this manner had not come within his observation. He expressed further the view that, if medical overspecialization and overburdening of physicians could be done away with, it would inure to the benefit of a rational mode of treatment in general. His statements were worthy of attention because of his skilful argumentation.

Seventieth Birthday of Professor Brauer

Prof. Ludolph Brauer, for many years professor of internal medicine and director of the Eppendorf Hospital, celebrated his seventieth birthday, July 1. A pupil of the Heidelberg clinician Erb, he obtained a chair at the University of Marburg, whence he was summoned to the University of Hamburg, where he remained until his retirement. Brauer's fame rests chiefly on his researches in the field of tuberculosis; for example, on the treatment of adhesive pericarditis, in which he recommended the removal of ribs adherent to the pericardium, in order to eliminate the manifestations of cardiac insufficiency. The overpressure procedure in the surgical treatment of the thorax originated with him. For the pneumothorax procedure he

created, through numerous researches, a broad scientific basis and brought it about that this procedure became accepted by those who opposed it. Importance attaches also to his researches on pleural shock and arterial air embolism in connection with the institution of pneumothorax or during the reinsufflation process. He supplied the scientific basis for more extensive thoracoplasty. Brauer has reached his goal, in aiding the widespread use of physical and surgical treatment of pulmonary tuberculosis, lung gangrene and bronchiectasis, and in the inauguration of functional tests in all diseases of the thorax by means of ingeniously devised endurance tests. Brauer combined great talent for organization with unusual skill in carrying on negotiations. He succeeded in winning over boards and philanthropists in favor of his plans for the creation of the tuberculosis institute, the department of metabolism, the diet kitchen, the institute for research on light, the insitute for medical research in the field of aviation, and others.

BUCHAREST

(From Our Regular Correspondent)

July 20, 1935.

Conference on the Problem of Abortion

The Rumanian Medical Association, the Society of Transylvanian Gynecologists and the medical chambers of the counties of Transylvania convoked a congress, which was attended also by many judges and lawyers, to discuss the problem of induced abortion and to draft a new law on criminal abortion. The congress found that:

1. The law drafted in 1934 largely satisfies the requirements. The congress approved prosecution for criminal abortion. However the congress voted to appeal to the competent authority requesting a change in the law so that artificial abortion may be permissible from medical, eugenic and ethical points of view. Accordingly the law should not apply to the use of contraceptives, and their sale by druggists should be permitted. 2. Abuse of the eugenic and ethical indications for artificial abortion should be severely punished. The congress held that the paragraph of the law that requires physicians preliminary to performing such operations to notify the police should be canceled. 3. The general council of the Rumanian Medical Chambers should be invited to compile a guide as to the indications and methods of operation. 4. At the investigation of cases of criminal abortion, the presence of a medicolegalist is imperative. 5. If a doctor becomes suspended from practice on account of a gross error in performing the operation or malpractice, he may be allowed to continue practice if he passes an examination before the faculty of medicine of the university. The examination has to be in the subject in which he displayed incompetence.

The National League Against Tuberculosis

The minister of public health referred to the Chamber of Deputies the draft of a law on the organization of the National League Against Tuberculosis. The objectives of the league would be to conduct the antituberculosis campaign, to coordinate existing similar institutions, to enlighten the public by adequate propaganda, to train special personnel—physicians, assistants, nurses—and to found dispensaries, isolation hospitals, sanatoriums, preventoriums and all institutions necessary in the treatment and prophylaxis of tuberculosis. The king is the president of the council of the league. The administrative body is a central managing committee of seven members elected for five years. The income of the league would be 60 per cent of the net profit from the state lotteries, 60 per cent of the revenue derived from the taxes on cosmetics and proprietary medicines (5 per cent ad valorem duty, paid by the pharmaceutical manufacturers on imported foreign specialties), 10 per cent of the revenue from the manufacture of narcotics, and 2 per cent of the profit earned by the state alcohol monopoly. In addition, all public institutions engaged in treating the sick —for example, the social insurance office, the sickness club of the state railways, and private sickness clubs—will have to contribute annually to the campaign against tuberculosis. The branches of the league will get subsidies from the counties, cities and villages. The budget of the league will be subject to approval and control of the chamber of deputies. The medical positions will be temporary. All physicians will be appointed for two years, after the lapse of which time their positions will be surrendered to younger men, that these may have competent training in the prophylaxis and treatment of tuberculosis. These physicians will not receive pay, excepting their board, in hospitals and sanatoriums. Professor Cantacuzino, a zealous promoter of the antituberculosis movement, has been untiring in preparing the soil for the establishment of the national antituberculosis league.

Infant Mortality in Bucharest

According to the last annual report of the demographic bureau the most conspicuous phenomenon in connection with the increase of population is the rapid increase of mortality in the last year. Of 1,000 infants born alive, fourteen die within the first year.

There were 87,824 marriages in the country and 914 divorces. The most unfavorable position is in Bucharest. While the birth rate decreased considerably, the death rate increased. In May 1935 the number of births was 1,073 while the number of deaths amounted to 1,051. Infant mortality is still more unfavorable. In Bucharest, 23 per cent of all infants die under the age of 1 year. There are two other Rumanian towns in which infant mortality is similarly high, namely, Jassy, the capital of the province of Moldavia, where it is 26 per cent, and Tighina, close to the Russian frontier, where it is 27 per cent.

Public health conditions in general were better in 1934 than in 1933.

Regulation of the Use of the Term Radiologist

The Bucharest Association of Radiologists, at a recent meeting, gave expression to the opinion that the time has come when steps should be taken to prevent the use of x-ray apparatus by those whose capabilities are insufficient. At present, any physician may purchase and use x-ray equipment for diagnostic and therapeutic purposes. The frequent accidents that have occurred, one of them fatal, makes it imperative that some discrimination be made. The association would not object if private practitioners used x-ray equipment for their own patients for diagnostic purposes, but no one excepting competent radiologists should make x-ray reports that may serve as a ground for operations. High voltage therapy, which is dangerous even in the case of well trained radiologists, should be applied only by radiologists who have passed special examinations proving their fitness. The association sent a memorandum to the Central Medical Chamber to elaborate the draft of a new enactment prescribing the qualifications of a physician who is to practice as a radiologist.

Observations of Effect of Radio Waves on Employees

Some time ago W. W. Parker, an English physicist, stated in a treatise that the radiations of radio broadcasting stations are apt to cause neurasthenia and certain other abnormal states of the nervous system. Prof. Dr. Francis Porsche of the Cluj University has made extensive investigations into this subject. He says that as a check on the probability of the correctness of the statements of Parker he made thorough investigations at several radio stations. He examined individuals who are employed at the transmitting stations and who are exposed in a concentrated measure to the actions of the radio waves. Such observations on the employees as he made, says Professor Porsche, and those of physicians employed at such stations for many years, did not corroborate Parker's assumptions.

AUSTRALIA

(From Our Regular Correspondent)

July 11, 1935.

Tuberculosis Campaign in Australia

The federal health council has drawn up plans for a nation-wide effort to combat tuberculosis. These recommendations will be forwarded to each state health department to the end of securing uniformity of action. In Australia each year, tuberculosis kills 3,000 people, two thirds of them being under the age of 45. The rate keeps fairly constant at 4.5 per cent of total deaths. The age of death is at a maximum in the 30-40 age group for females, and the 40-50 age group for males. It is seventh in order of importance as a cause of death, being preceded by heart disease, cancer, nephritis, senility, accidents and diseases of early infancy, in that order.

The federal health council considers that the economic factor is the most important aspect of the campaign against tuberculosis. The wage earner of a family frequently will not leave his family as long as he is able to contribute anything toward its support. Possibly the greatest of the advances toward an effective control of tuberculosis would be the introduction of some system for providing economic conditions of at least a bare living standard for the family, to enable the affected wage earner to enter a treatment institution as early as possible. The amount of 17/6 per week paid under the invalid pensions act is not more than a partial relief of the inevitable economic distress in a home in which there is a member with tuberculosis. The attention of the commonwealth government is directed to the fact that before a person can receive an invalid pension he must be certified as permanently and totally incapacitated, whereas in every early case of tuberculosis the hope, for which there is reasonable ground, is that there will be a cure. If possible, it would be desirable to alter the wording of the pensions act in relation to tuberculosis.

The compulsory notification of all forms of tuberculosis is considered to be essential to success in the campaign against tuberculosis. It is strongly recommended that there be an adequate fee for such notification and that in any case arrangements be made for payment direct to the notifying physician without cumbersome procedure. It is considered essential to have a full-time tuberculosis officer in every state. Periodic medical examination of all persons in the community should be encouraged. An effective organization should exist in every state for the periodic examination of house and family contacts of a patient with tuberculosis, when necessary, without charge to the persons examined. The examination of sputum should always be available without charge at the request of any medical practitioner.

A practical method of providing skilled supervision of cases and contacts, of providing consultant advice to all medical practitioners, and of educating the public, would be to provide a mobile tuberculosis unit.

It is regarded as of primary and immediate importance to establish an effective system where it does not now exist for the earliest possible treatment of early cases. When conditions are entirely suitable, but not otherwise, there are advantages in home treatment that should not be overlooked. Legal power should be available when necessary, for compulsory isolation in advanced cases in which the conditions involve danger to the public health. It is desirable to bring into effect, and maintain, separation of the advanced and hopeless cases from cases with prospect of cure. Probably the best method of achieving this is hospital accommodation under the same management as that of the sanatorium.

The conference believed that for the success of the campaign against tuberculosis it is desirable to establish close cooperation between health departments, education departments, hospitals, the medical and nursing professions, local government authorities, and all other agencies concerned. Especially is cooperation between health departments and the commonwealth pensions department necessary. The work being done by the Red Cross homes and similar institutions in building up the resistance of children was greatly commended, but the conference believed that the work of these establishments would be considerably improved in extent and value if the authorities would agree to admit children who, although known to be infected with tuberculosis, have been certified by a selected medical officer as not infective. The provision of preventoriums at which may be treated persons who have been exposed to infection and whose health and environmental conditions are unsatisfactory is an essential link in the chain of preventive measures.

The Spread of Tumors in the Human Body

R. H. Willis of the Baker Institute of Medical Research, Melbourne, has reviewed the literature and recorded personal and meticulous observations of 323 necropsies in cases of malignant disease. It is felt that this book, published by J. & A. Churchill of London, will for years be a standard work of reference. Willis clears up many pathologic pitfalls. He strongly doubts the entity of primary endothelioma of the lymph gland and considers these tumors usually carcinomatous metastases. He decries the possibility of specific premetastatic changes in lymph glands and of tumor cells being destroyed in lymph glands. He draws attention to the distinction that exists between the phenomena of contiguity invasion and metastasis. He refutes the hypothesis of tumor cell implantation of contact or "kissing" cancers on epithelial surfaces. The adherence and departures from structural types in metastases are indicated, and the literature covering the interesting occurrence of spontaneous retrogression of tumors is reviewed and our ignorance of some deeply underlying biologic laws indicated. In view of the unfortunate absence of pain in early malignancy it is interesting to note Willis's inability to demonstrate nerve fibers (that were not included residues) in tumor cells and their stroma. In 7 per cent of his series of necropsies, metastatic growths had been clinically mistaken for the primary. Attention is directed to the effect of these errors on statistical figures. The important clinical question of the safety or otherwise of the biopsy incision he settles by stating that the risk is negligible. The only dangers are (*a*) implant tumors when healthy skin is cut through and (*b*) dissemination aggravation by rough handling. It is advisable, however, to proceed with the radical treatment, if called for, within a few days.

Shark Acts as Detective

Medicolegal experts in Sydney are involved in a case that sounds more like fiction than a real life and death problem. The story starts on the ocean beach at Sydney, where some fishermen had set a bait for a man-eating shark that had been roaming up and down the surfing beaches. The shark did not take the bait but became so hopelessly foul of the line that it was hauled ashore alive. The shark was then taken alive to the large sea-water pool in the aquarium at the Sydney Zoological Gardens. For a few days the shark was listless and appeared ill. Suddenly, however, it became excited, thrashed the water into foam, and to the horror of several casual onlookers vomited a human arm. The limb was recovered from the pool and a close examination revealed some tattoo marks of a type that sailors adopt for the adornment of their bodies. Police inquiries were made toward identification of the arm and by means of the tattoo marks it was recognized as belonging to James Smith, a sailor. Further inquiries elicited the news that about April 8 this man went fishing in a boat with one Patrick Brady and that the latter returned alone. It now appears that Smith was murdered by Brady in the boat and that his body was dismembered and thrown into the water. A startling sequel was the murder of the chief witness in the case, William Holmes, a boat builder.

This man was taken for a ride in his own car and shot. The car containing the body was found in a lane in the shadow of the great North Shore bridge at Sydney.

The Menace of the Cat

In the editorial comment in THE JOURNAL, April 30, 1932, entitled "The Menace of the Cat" appears the statement that "millions of domestic cats gone wild are said to inhabit Australia and are rapidly destroying the bird life of that continent." While there are many instances in this country of primarily domestic animals "going bush" and becoming a menace, the cat is not a serious problem. The chief problem is the dog, who becomes a dingo and causes havoc among the sheep pastured in the outback country. To a lesser extent the horse becomes a "brumby." The damage he does is tempting the ranch horses to escape. The health hazards that the cat introduces are mainly skin diseases of the tricophyton type, infected scratch marks and, indirectly, strychnine poisoning of children from the baits that are placed for the destruction of the animal. While cats destroy birds, their activities are not of any moment to the avian life of the country.

NETHERLANDS

(From Our Regular Correspondent)

July 17, 1935.

Traffic Accidents During 1932

The Central Bureau of Statistics has published for the first time a monograph giving detailed information on the causes of traffic accidents. All accidents on the public highways that caused substantial material damage and resulted in the death or injury of human beings are taken into consideration. The work reveals that in a total of 41,195 accidents the driver was responsible in 28,221 instances and the pedestrian was at fault in 2,975 cases. In 2,788 cases the bad condition of the road was the cause of the accident. In addition, there were 6,254 "diverse" causes. Collisions between bicycles or between a bicycle and other vehicle are most frequent, because of the large number of bicycles on the streets. To enumerate: There were 381 instances of a collision between a bicycle and a street car, 3,564 collisions between a bicycle and a truck, 7,336 with an automobile, 981 with a motorcycle, 2,928 with another bicycle, 145 with a pedestrian, 150 with a pushcart, and 559 with a horse-drawn vehicle.

Of collisions of an automobile with a street car there were 851 instances; with a truck, 3,215; with another automobile, 4,582; with a motorcycle, 1,067; with a bicycle, 7,336; with a pushcart, 556; with a horse-drawn vehicle, 835, and with a pedestrian, 1,441.

Of collisions of a truck with a street car there were 728 instances; with another truck, 1,617; with a motorcycle, 447; with a bicycle, 3,564; with a horse-drawn vehicle, 611; with a pushcart, 427, and with a pedestrian, 739. One should take account of the fact that 94 per cent of the vehicles were bicycles, 1.56 per cent were trucks, and 2.74 per cent were automobiles.

The source of information concerning the fate of persons seriously wounded is not reliable. Many communes have no infirmary. The wounded in that case are transported to the nearest city, where the consequences of the accident are often lost sight of.

First Aid Stations Along the Highways

A society has been recently organized in the Netherlands for the purpose of establishing 2,550 first aid stations along the principal highways at intervals of approximately 5 kilometers (3 miles). The administration of the work of the society has been entrusted to Dr. J. G. Van Turenhout. At each station there is a telephone, which enables an injured person to get in touch with a physician, police station, sanitary service, the clergy, or other connections. The station consists essentially of a large square box, which contains a small supply of bandages ready for immediate use. There is also a larger box of dressings for the use of the physician. A folding stretcher, of special construction, makes it possible to transport an injured person in an automobile. The medical control of this new service will be entrusted to the Red Cross, in collaboration with the Orange Cross. A large number of physicians have expressed their willingness to cooperate with the members of this society.

Convention on Aviation Medicine

The draft of legislation approving an international sanitary convention in relation to aviation was recently submitted to the general assembly. The convention was drawn up by the international sanitary bureau, the headquarters of which is at Paris, and will consider what measures should be taken to prevent the dissemination of contagious diseases through aviation. The endorsement of the Netherlands is manifested by the fact that the aviation centers at Schiphol, Weelhaven, Schellingwoude, Flushing and Twente are to have a "health organization" that will adopt all measures necessary to prevent the spread of contagious diseases. A physician will be available for each center of aviation. If circumstances seem to require it, passengers and crew will be subjected to a medical examination before the departure of each plane. Authority to embark will be refused to any person who presents symptoms of a contagious disease. A rapid enforcement of the terms of the convention is to be desired. It has been found acceptable in all respects to the Dutch East Indies. As for Surinam and Curaçao, the expense involved will be too high for those countries.

Tuberculosis in Schools

The large number of cases of contagion from tuberculosis occurring in certain schools last year has shown the absolute necessity of adopting preventive measures.

The draft of a law the purpose of which is to protect school children against contagious diseases that are likely to be communicated to them by the instructional corps has been submitted. The law would require applicants for positions in schools to present a medical certificate attesting that they are not affected with open or active tuberculosis. Periodic medical examinations of the instructing personnel are associated with difficulties by reason of the excessive number of persons who would be required to submit to the examination. The measure will probably be just as effective if all the suspicious cases are reexamined by the health officers of each commune.

Several articles that have appeared were conceived with the purpose of removing from the schools all persons who are not holders of a health certificate. If, after a certain length of time, teachers who are removed are not reinstated, they will be subjected to a medical examination and will be pensioned.

The government admits the justice of according a new medical examination to every person dismissed who makes such a request. The sanitary commission appears fitted to organize such sanitary control.

Marriages

PAUL S. SLOAN, Charlevoix, Mich., to Miss Alta La Verne Zimmerman of Oberlin, Ohio, June 17.

JAMES STANLEY SMITH to Miss Eleanor Dexter Mussina, both of Williamsport, Pa., June 7.

JUSTIN ANTHONY ROGERS to Miss Alice Jane Vessey, both of San Francisco, August 14.

EUGENE C. EPPINGER, Boston, to Miss Catherine Codman at Westwood, Mass., July 13.

MORRIS ZIMMERMAN to Miss Estelle Keller, both of New York, August 20.

NED CAMP, Atlanta, Ga., to Miss Julia Thompson of Barnesville, June 15.

Deaths

George Hughes Kirby, professor of clinical psychiatry at Cornell University Medical College, New York, died suddenly, August 11, at Wentworth-by-the Sea, Portsmouth, N. H., aged 60. Dr. Kirby was born at Goldsboro, N. C., in 1875. He received a bachelor of science degree from the University of North Carolina in 1896 and doctor of medicine from the Long Island College Hospital, Brooklyn, in 1899. From 1902 to 1908 he was associate in clinical psychiatry at the Psychiatric Institute in New York; he was director of the institute from 1917 to 1931 and he planned the New York State Psychiatric Institute and Hospital as a unit of the Columbia-Presbyterian Medical Centre. From 1908 to 1917 he was director of clinical psychiatry at the Manhattan State Hospital. During the World War he served in the Army medical corps and since the war has been consultant in neuropsychiatry for the United States Public Health Service. In 1921, he was appointed by the Secretary of the Treasury a member of the Board of Consultants to Develop Hospital Facilities Throughout the Country for Ex-Soldiers. He was professor of psychiatry at the University and Bellevue Hospital Medical College from 1914 to 1917, Cornell University Medical College from 1917 to 1927 and the Columbia University College of Physicians and Surgeons from 1927 to 1932. He was a member of the Medical Society of the State of New York, the American Neurological Association, the Association for Research in Nervous and Mental Disease and the National Committee for Mental Hygiene. Dr. Kirby was a past president of the American Psychiatric Association, the New York Neurological Society, the New York Psychiatric Society and the New York Society for Clinical Psychiatry. He was a member of the medical council of the Veterans' Administration, Washington, D. C.; consulting psychiatrist to the Presbyterian Hospital, New York Psychiatric Institute and the New York Neurological Institute. He was a member of the medical advisory committee of the New York State Hospital Development Commission. Dr. Kirby was also associate editor of the *American Journal of Psychiatry* and was on the editorial board of the *Psychiatric Quarterly*.

Cornelius Van Zwaluwenburg ✠ Riverside, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; member of the House of Delegates of the American Medical Association, 1919-1923; past president of the California Medical Association and formerly councilor of the first district; past president and secretary of the Kalamazoo (Mich.) Academy of Medicine; fellow of the American College of Surgeons; on the staff of the Riverside Community Hospital; aged 72; died, July 23.

John **Murray Johnson** ✠ Bridgeport, Conn.; Long Island College Hospital, Brooklyn, 1895; past president of the Fairfield County Medical Society; member of the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; formerly member of the board of education; on the staff of St. Vincent's Hospital; aged 61; died, July 2.

James **Cornelius Gill,** Chicago; Rush Medical College, Chicago, 1890; professor of clinical neurology at his alma mater; member of the Central Neuropsychiatric Association; on the staffs of the Presbyterian Hospital, Cook County Psychopathic Hospital and the Illinois Masonic Hospital; aged 69; died, July 1, in the Washington Boulevard Hospital of uremia.

Walter **Beran Wolfe** ✠ New York; Washington University School of Medicine, St. Louis, 1924; at one time served in the medical corps of the U. S. Navy; formerly psychiatrist of the Children's Court of Manhattan; author of a recent book entitled "A Woman's Best Years"; aged 35; was killed, August 15, at Martigny, Switzerland, in an automobile accident.

William **Matthew Kenna,** Washington, D. C.; Yale University School of Medicine, New Haven, 1892; assistant in clinical medicine, 1897-1898, and assistant in neurology, 1900-1904, at his alma mater; served during the World War; aged 66; on the staff of St. Elizabeth's Hospital, where he died, July 1, of heart disease.

John **Arthur Turner,** Cincinnati; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1909; member of the Ohio State Medical Association; served during the World War; aged 51; died, June 19, in the Deaconess Hospital, of coronary thrombosis and arteriosclerosis.

Homer Brush Jones, Brooklyn; University of the City of New York Medical Department, 1891; member of the Medical Society of the State of New York; for many years connected with the health department; on the staff of the Brooklyn Eye and Ear Hospital; aged 69; died, July 27, in the Brooklyn Hospital.

Gayle Aiken, New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1891; Hahnemann Medical College and Hospital, Chicago, 1892; formerly secretary of the Homeopathic Board of Medical Examiners; aged 75; died, July 20, in the Baptist Hospital, of carcinoma of the prostate.

Frank Adelbert Southwick ✠ Stevens Point, Wis.; Medical School of Maine, Portland, 1881; for many years member of the school board; formerly health officer of Stevens Point; aged 77; on the staff of St. Michael's Hospital, where he died, July 23, of pulmonary embolism.

John W. Hermetet ✠ Macomb, Ill.; Chicago Homeopathic Medical College, 1896; formerly secretary of McDonough County Medical Society; medical director of the Marietta Phelps Hospital; aged 63; died, August 4, in the Memorial Hospital, Buffalo, of pneumonia.

William Jennings Bryan McAuliffe ✠ Juneau, Alaska; University of Louisville (Ky.) School of Medicine, 1926; served during the World War; surgeon in charge of the United States Hospital for Natives; aged 38; was found dead, July 4, of coronary thrombosis.

Fred Wood Phifer ✠ Wheatland, Wyo.; University of Maryland School of Medicine, Baltimore, 1902; formerly secretary of the Platte County Medical Society; on the staff of the Wheatland General Hospital; aged 58; was killed, May 31, in an automobile accident.

Richard Ernest Poole, Veterans Home, Calif.; University of Maryland School of Medicine, Baltimore, 1892; member of the California Medical Association; on the staff of the Veterans Home Hospital; aged 58; died, June 13, of chronic myocarditis.

John Hillman McLain, Jackson, Miss.; Jefferson Medical College of Philadelphia, 1913; served during the World War; formerly on the staff of the Mississippi State Charity Hospital; aged 47; died, June 6, in a local hospital.

Stewart Vernon Irwin ✠ Oakland, Calif.; Johns Hopkins University School of Medicine, Baltimore, 1915; fellow of the American College of Physicians; served during the World War; aged 44; died, July 1, in San Francisco.

Otto Hensel ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1900; on the staff of the Lenox Hill Hospital; aged 59; died suddenly, July 14, in Honesdale, Pa., of coronary thrombosis.

Henry Charles Schomberg Elliot, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1888; L.R.C.P., Edinburgh, Scotland, 1893; served during the World War; aged 68; died, July 1, in the Toronto General Hospital.

Allen Lewis Krepps, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1897; member of the Medical Society of the State of Pennsylvania; aged 63; died, June 24, of chronic myelogenous leukemia.

James Monroe Smith, Watertown, N. Y.; University of the City of New York Medical Department, 1889; member of the Medical Society of the State of New York; aged 72; died, May 10, of angina pectoris.

Menzo White Herriman, Long Island City, N. Y.; Syracuse University College of Medicine, 1881; member of the Medical Society of the State of New York; aged 77; died, July 26, of carcinoma of the bladder.

George Noble Macomber, Denver; Pulte Medical College, Cincinnati, 1878; associate member of the Colorado State Medical Society; aged 81; was found dead, July 15, of angina pectoris and chronic myocarditis.

Jean Phillipe Auguste Martin, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, 1904; formerly on the staff of the Hotel Dieu Hospital, Campbellton, N. B.; aged 58; died, April 1.

Mary Scott Jones, Boston; Woman's Medical College of Pennsylvania, Philadelphia, 1892; member of the Massachusetts Medical Society; aged 80; died, June 16, in the New England Deaconess Hospital.

Roy McMillan Wheeler, Sycamore, Ill.; Northwestern University Medical School, Chicago, 1900; member of the Illinois State Medical Society; aged 64; died, May 19, of carbon monoxide poisoning.

William Henry Taylor, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1904; served during the World War; aged 56; died, June 18, of heart disease and chronic nephritis.

Thaddeus M. McNamara ⊕ Bakersfield, Calif.; Cooper Medical College, San Francisco, 1905; past president of the Kern County Medical Society; aged 54; died, July 15, of coronary occlusion.

Joseph Stanley Swoboda, Butte, Mont.; University of Nebraska College of Medicine, Omaha, 1927; member of the Medical Association of Montana; aged 38; died, June 26, of acute myocarditis.

Louis Adolph Grimme ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1891; aged 70; died, July 21, of myocarditis and coronary sclerosis.

Charles Vernell High Sr., Midland, Mich.; Starling Medical College, Columbus, 1888; member of the Michigan State Medical Society; served during the World War; aged 69; died, June 15.

George Robert Taylor, Clinton, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1886; aged 75; died, May 11, of carcinoma of the colon and peritoneum.

Charles Ridgway Blundell, San Gabriel, Calif. (licensed in New Jersey in 1894); veteran of the Spanish-American War; aged 66; died, June 25, of cerebral hemorrhage and bronchopneumonia.

Goldie Dean Tyler, Jackson, S. C.; Medical College of the State of South Carolina, Charleston, 1896; aged 64; died, June 1, in the University Hospital, Augusta, Ga., of lobar pneumonia.

Oswald B. H. Bowser, Richmond, Va.; Howard University College of Medicine, Washington, D. C., 1901; aged 55; died, July 6, of coronary embolism, chronic myocarditis and nephritis.

Joseph McGowan Harrigan, Wilkes-Barre, Pa.; Temple University School of Medicine, Philadelphia, 1928; member of the Medical Society of the State of Pennsylvania; aged 33; died, June 15.

James Clair Glasser ⊕ Blairsville, Pa.; Medico-Chirurgical College of Philadelphia, 1914; aged 48; died, May 18, in the Allegheny General Hospital, Pittsburgh, of streptococcic endocarditis.

Jonathan O. Torrence, Hot Springs National Park, Ark.; Meharry Medical College, Nashville, Tenn., 1917; aged 45; died, May 9, of pulmonary tuberculosis and cirrhosis of the liver.

Robert M. Tafel, Phoenix, Ariz.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1895; aged 76; died, July 3, in Williams, of myocarditis and coronary thrombosis.

Sam E. Rees, Purvis, Miss.; Memphis (Tenn.) Hospital Medical College, 1902; member of the Mississippi State Medical Association; aged 64; died, July 2, of carcinoma of the lung.

William Ernest Hubbert, Dallas, Texas; University of the South Medical Department, Sewanee, Tenn., 1901; served during the World War; aged 55; was shot and killed, July 31.

Jessie Amelia Birnie, Peterborough, Ont., Canada; Trinity Medical College, Toronto, 1898; aged 77; died, June 17, in San Rafael, Calif., of carcinoma of the transverse colon.

Elias Mortimer Duffield, Glassboro, N. J.; Jefferson Medical College of Philadelphia, 1899; formerly mayor and president of the board of education; aged 60; died, June 27.

William Vaux Ewers, Somerset, Bermuda; University of Pennsylvania Department of Medicine, Philadelphia, 1894; served during the World War; aged 63; died, July 4.

Harper W. Robertson, Waelder, Texas; University of the City of New York Medical Department, 1890; aged 71; died, May 3, of coronary thrombosis and chronic myocarditis.

Oran Merton Belfry, Lansdowne, Pa.; Trinity Medical College, Toronto, Ont., Canada, 1884; L.R.C.P., L.R.C.S., Edinburgh, Scotland, 1884; aged 79; died, July 22.

Francis Emerson Johnson, Erving, Mass.; Dartmouth Medical School, Hanover, N. H., 1882; member of the Massachusetts Medical Society; aged 78; died, May 1.

John S. Strickland, Alice, Texas; University of Tennessee Medical Department, Nashville, 1892; county health officer; aged 69; died, June 15, of pulmonary tuberculosis.

John Bates Todd, Syracuse, N. Y.; Albany (N. Y.) Medical College, 1874; member of the Medical Society of the State of New York; aged 80; died suddenly, June 23.

William S. Yazell, Maysville, Ky.; Cincinnati College of Medicine and Surgery, 1891; member of the Kentucky State Medical Association; aged 68; died, June 14.

Anderson F. Brown ⊕ Malta Bend, Mo.; Washington University School of Medicine, St. Louis, 1904; aged 58; died, July 5, in Kansas City, of pulmonary edema.

Charles L. Boyd, Greeneville, Tenn.; Baltimore Medical College, 1901; aged 58; died, June 19, in the Greeneville Hospital, of angina pectoris and hypertension.

Harry Lee Brush, Conneaut Lake, Pa.; Starling Medical College, Columbus, 1889; served during the World War; aged 69; died, June 22, of cerebral hemorrhage.

Lyle Lester Bristol, Caliente, Nev.; Loyola University School of Medicine, Chicago, 1930; aged 30; died, July 5, in Los Angeles, of melanosarcomatosis.

Willam Joseph Love ⊕ Opelika, Ala.; Atlanta Medical College, 1882; past president of the Lee County Medical Society; aged 75; died, June 29.

Levi Abram Sherk, Avon, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1873; aged 84; died, May 21, of cerebral hemorrhage.

Charles William Marlatt, St. Thomas, Ont., Canada; Trinity Medical College, Toronto, 1872; M.R.C.S., England, 1872; aged 89; died, May 31.

Elizabeth C. Zindel Taylor, Paris, Texas (licensed in Texas under the act of 1907); died, June 21, of a streptococcic infection of the lower lip.

Charles Lemaire, Ste. Clothilde de Horton, Que., Canada; Victoria University Medical Department, Coburg, Ont., 1890; aged 70; died, March 27.

Walter S. Wallace, Long Beach, Calif.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 83; died, June 4, of valvular heart disease.

Charles Henry Kingsbury, West Brookfield, Mass.; University of Vermont College of Medicine, Burlington, 1899; aged 68; died, June 26.

Mary Bird Bowers, Los Angeles; College of Physicians and Surgeons of San Francisco, 1898; aged 83; died, June 30, of cerebral thrombosis.

John T. Pitkin, Buffalo; University of Buffalo School of Medicine, 1884; aged 78; died, May 17, of epithelioma of the hand with metastasis.

William Henry Porter, Beaver, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1897; aged 74; died in June, of cerebral hemorrhage.

William P. Thelen, Wilton, N. D.; University of Minnesota Medical School, Minneapolis, 1902; aged 59; died, July 19, of heart disease.

William Stephen Keegan, New York; Bellevue Hospital Medical College, New York, 1894; aged 84; died, July 26, of chronic myocarditis.

Gustav Adolf R. Koerber ⊕ Hoisington, Kan.; Omaha (Neb.) Medical College, 1897; aged 60; died, May 31, of diabetes mellitus.

Joseph Jacobsohn, Memphis, Tenn.; University of Louisville (Ky.) Medical Department, 1887; aged 79; died, May 13, of myocarditis.

William Stanton Card, Fredonia, N. Y.; Denver and Gross College of Medicine, 1903; aged 68; died, July 27, of cerebral hemorrhage.

Thomas Eldon Graham, Albany, Mo.; Barnes Medical College, St. Louis, 1893; aged 73; died, July 11, of coronary thrombosis.

John Alexander Jones, Ottawa, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1874; aged 80; died, May 15.

Rankin S. Reiff, Los Angeles; Jefferson Medical College of Philadelphia, 1907; aged 50; died, June 13, of chronic myocarditis.

George Allen Kennedy ⊕ Limon, Colo.; Denver and Gross College of Medicine, 1906; aged 55; died, June 27, of myocarditis.

Wiley E. Sturgis, Los Angeles; Kansas City (Mo.) Medical College, 1897; aged 64; died, June 17, of carcinoma of the rectum.

James Edward Rainey, Clarksville, Texas; Kentucky School of Medicine, Louisville, 1904; aged 57; died, June 20.

Frank M. Jackman, Mead, Okla.; Louisville (Ky.) Medical College, 1891; aged 72; died, June 16, of angina pectoris.

Eli James, Fairland, Okla.; Joplin College of Physicians and Surgeons, Joplin, Mo., 1881; aged 85; died, July 2.

John A. Pennington, Cato, Ark. (licensed in Arkansas in 1907); aged 63; died, June 18, of heart disease.

Correspondence

DIAGNOSIS BY CULTURAL METHODS OF RECTAL GONORRHEA IN WOMEN

To the Editor:—The excellent results obtained by Dr. A. Charlotte Ruys in the diagnosis of rectal gonorrhea by cultural methods, as reported in her communication in THE JOURNAL, May 18, page 1844, indicate painstaking effort. To clarify my own position: In the article entitled "Rectal Gonorrhea in Women" (THE JOURNAL, January 19, p. 192) it was stated: "In our experience, cultural methods of isolation and identification [of gonococci from the rectum] have been inconclusive in too many instances to justify confidence in them." The value of cultural methods for the isolation of the organism is not questioned, but their application is difficult and the laboratory reports we received evidence this. I am informed by Herrold that the use of the oxydase reaction as emphasized by McLeod and his co-workers might increase the value of cultivation methods when gonococci are associated with a number of other bacteria, as in rectal cultures. The addition of 1 per cent p-aminodimethylaniline hydrochloride to the surface growth is followed by a black appearance of the gonococcus colonies within a few minutes. This procedure may simplify the problem.

To study by cultural methods a series such as I reported, a laboratory technician under competent direction, devoting a major portion of his time, if not all of it, to the work, would have been needed and such was not available. My experience leads me to believe that a diagnosis can generally be made from smears. The practical aspect of the matter is that such smears should be made from the rectum of women who have genital gonococcic infection and if well stained and properly studied will reveal the gonococci in the great majority of cases if these organisms are present.

CLEMENT L. MARTIN, M.D., Chicago.

SUTURE OF STAB WOUND OF HEART

To the Editor:—In their article on suture of stab wound of the heart (THE JOURNAL, June 1, p. 1979) Drs. George Benet and Charles Gordon Spivey say: "The first recorded attempt to suture a stab wound of the heart was made by Cappelan in 1895." I desire to call to their attention the fact that on July 9, 1893, Dr. Daniel Hale Williams, Negro surgeon of Provident Hospital in Chicago, performed a successful surgical exploration of the heart for a stab wound. He recorded this case in the *New York Medical Record* (**51**:437 [March 27] 1897) under the title "Stab Wound of Heart and Pericardium."

CHARLES H. GARVIN, M.D., Cleveland.

ACETYL-BETA-METHYLCHOLINE

To the Editor:—In the interest of scientific accuracy, attention should be called to certain misconceptions likely to arise from the report of the Council on Pharmacy and Chemistry on "acetyl-beta-methylcholine" (THE JOURNAL, July 27, p. 281) and the editorial on the same subject (p. 284). Both items suggest that this substance was first prepared by Taveau (Bull. 73, Hyg. Lab., U. S. P. H. S., October 1911) and that its pharmacologic properties were first established by Hunt (*ibid.* and *J. Pharmacol. & Exper. Therap.* **6**:477, 1914-1915). Since serious doubt on the chemical identity of the compound prepared by Taveau for Hunt was shown by Major and Cline (*J. Am. Chem. Soc.* **54**:244, 1932), who did definitely synthesize acetyl-beta-methylcholine and establish its true physical and chemical properties, it seems only fair that the Council at least should refer to Major and Cline's work. Simonart's statement on the pharmacologic study of the pure compound and Major and Cline's statement on priority of its synthesis perhaps appeared too recently (*J. Pharmacol. & Exper. Therap.* **54**:105 and 131 [May] 1935) for inclusion in the Council report.

Since the Council presumes to discuss the general physiologic significance of choline derivatives, it would also seem only fair to refer to the excellent review on this subject prepared by G. A. Alles (*Physiol. Rev.* **14**:276 [April] 1934).

C. D. LEAKE, PH.D., San Francisco.
Professor of Pharmacology, University of California Medical School.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF SYPHILIS

To the Editor:—A woman, aged 24, contracted syphilis about February 1933. It was a primary positive case when treatment was instituted (about the beginning of April 1933). Until May 10, 1933, she had received six weekly injections of neoarsphenamine at a clinic. On May 10 and 17 I gave her an injection of 0.6 Gm. of neoarsphenamine. From May 4 to June 30 she received twice a week an intramuscular injection of 2 cc. of Sol-Bi (Fraisse) and during this time she was on mixed treatment by mouth. Starting on July 10 she was given weekly injections of 0.6 Gm. of neoarsphenamine up to September 11. September 18, biweekly injections of iodobismitol 2 cc. were given until October 16. Starting October 16 she received weekly injections of 0.6 Gm. of neoarsphenamine and on the same days that the neoarsphenamine was injected she would be given an intramuscular injection of 4 cc. of iodobismuthate. This was continued until December 11. On December 15 I started her on biweekly injections of 2 cc. of bismogenol and continued this treatment until Jan. 29, 1934, on which she was given 0.3 Gm. of neoarsphenamine. On February 2 she received 2 cc. of bismogenol and on February 5 she received 0.3 Gm. of neoarsphenamine. The Wassermann reaction on several occasions prior to this time had been 4 plus but on Jan. 15, 1934, it was plus-minus and on February 5 it was again 4 plus. On February 19 she was again started on biweekly injections of bismogenol 2 cc. and this was continued until April 6. On April 9 she was started on weekly injections of 0.6 Gm. of neoarsphenamine until June 11. A spinal Wassermann test, May 7, was reported as negative but the blood was still 4 plus. June 15 she was started on biweekly injections of 2 cc. of mercurosal and during this time was given 30 grains (2 Gm.) of potassium iodide three times a day. These were intramuscular injections; but from July 12 to August 16 she was given 4 cc. of mercurosal intravenously, twice a week, and also was taking the potassium iodide by mouth. From August 20 to October 10 she received weekly injections of 0.45 Gm. of neoarsphenamine. From Oct. 15, 1934, to Jan. 5, 1935, she received biweekly injections of 0.2 Gm. of thiobismol intramuscularly. December 11 the Wassermann reaction was 1 plus and on January 8 it was again 4 plus. January 8 I started her on weekly injections of silver arsphenamine 0.2 Gm. and am also giving her injections of bismogenol 2 cc. at the same time. Do you advise continuing treatment in this case and if so, how long and what treatment should the patient receive? If she should become pregnant would it be necessary to treat her during the pregnancy? Please omit name if published.

M.D., New York.

ANSWER.—As near as it can be made out, the patient has had her syphilis about two years. In this period she has received forty-three injections of neoarsphenamine and three injections of silver arsphenamine, making a total of forty-six doses of an arsenical; sixteen injections of a bismuth preparation, with accompanying treatment of an unstated nature by mouth; sixteen injections of iodobismitol; twenty-six of bismogenol, a bismuth salicylate; eighteen of mercurosal, and twenty-two of thiobismol—or a total of 80 bismuth and 18 mercurosal injections. Continuous therapy has been wisely used. The only criticism that one would have of this therapy would be that the correspondent has not used Council accepted products entirely, thus running the risk of using preparations of uncertain contents and actions. This applies to Sol-Bi. With respect to mercurosal, it has been shown by Sollmann, Schreiber and Cole (Comparative Diuretic Response to Clinical Injections of Various Mercurials, in process of publication) that this product has the same type of action as salyrgan and novasurol; a very high and rapid excretion of mercury, which drops rapidly and probably has little or no effect on syphilis. Thus in the period from June 15 to August 15, when the patient was under

therapy with mercurosal either intramuscularly or intravenously, one would be forced to conclude that she was practically on vacation.

A lumbar puncture has been wisely done and nothing found present in the spinal fluid. The chances are that the patient will not develop an involvement of this system in the future.

Probably a careful examination of the cardiovascular system should be made to rule out the possibility of an aortitis; to explain the persistently positive Wassermann reaction on the blood. If this is done and no evidence of cardiovascular disease is found after roentgen examination, one would be inclined to advise simply giving the patient a rest for two months, with plenty of fresh air and good food and regular hours, and then giving her a course of bismuth salicylate intramuscular injections, each 0.1 Gm., for a series of twelve injections once in six months for a period of another year or more, depending on circumstances. After all, the patient and not the syphilis is being treated, and the patient has already had good therapy. In a case like this, which has received good continuous treatment, a fetish should not be made of a positive Wassermann reaction. The Cooperative Clinical Studies have shown that the average patient who gets a total of from twenty to thirty injections of an arsenical and a like amount of heavy metals will probably escape most of the severe ravages of late syphilis.

In regard to the query as to the necessity of treatment during pregnancy, the Cooperative Clinical Group (Syphilis in Pregnancy, *Venereal Disease Information*, March 1934) advises the treatment of every syphilitic woman through each pregnancy, whether she is considered cured or not.

THE STERILITY-FERTILITY RHYTHM

To the Editor:—In the book "The Rhythm of Sterility and Fertility of Women," by Leo. J. Latz, M.D., the following statements are made, based on the works of Dr. K. Ogino of Japan and Dr. H. Knaus of Austria: 1. The spermatozoa live about two days after being deposited in the mother's body. 2. The unmated ovum retains its germinating ability only for twenty-four hours after it leaves the ovary. 3. Conception depends entirely on whether or not the spermatozoon happens to be in the fallopian tube within a day after the ovum has left the ovary. 4. In the twenty-eight day cycle, the periods from the first to the tenth day and from the eighteenth to the twenty-eighth day are totally sterile periods of the woman. I should like to know how medical science regards these statements and how reliable and authentic they are. Kindly omit name.

M.D., Indiana.

ANSWER.—The statements made by Latz in regard to the fertility-sterility rhythm are subject to controversy.

1. Spermatozoa have been found alive in the fallopian tube of women for as long as three weeks and a half (Dührssen) and two weeks (Fraenkel) after coitus. It has not been proved, however, how long the human spermatozoa retain their fertilizing power. Knaus's experiments were made on lower mammals and this may not be exactly comparable to human conditions.

2. There is available some evidence in favor of the view that the human ovum is fertilizable for only a short time after it leaves the ovary. Allen and his co-workers obtained human ova from washings of the fallopian tubes at operation between the fifteenth and eighteenth days of the menstrual cycle, showing definite signs of degeneration. Too few such observations have been made, however, to serve as conclusive evidence of either the time of ovulation or the life of the ovum.

3. Conception requires that fecund male and female gametes unite in the fallopian tube or in the uterine cavity. While they usually meet in the ampulla of the tube, they may meet, rarely, in the fimbria or even in the ruptured graafian follicle (primary intrafollicular ovarian pregnancy). When the ovum has definitely been proved to live for only twenty-four hours, one may rightly conclude that the spermatozoon must reach the ovum within a day of its expulsion from the follicle in order for conception to occur. The proof, however, is still lacking.

4. There is considerable controversial evidence in the literature on whether or not in the human being there is a definite sterile period. That some women have sterile days is likely, however. Dickenson presented the following evidence of 1,342 cases of women having a regular twenty-eight day cycle, with a history of a single coitus resulting in pregnancy: Conception occurred in 13 per cent during menstruation, in 72 per cent during the first two weeks of the cycle, and in less than 10 per cent in the fourth or premenstrual week. Fraenkel, from a personally observed series, similarly reported that there was no time in the month at which conception has not occurred in some women. Asdell, from a study of 568 cases, showed that the conception curve rose from the first to the eighth day of the cycle, falling first rapidly, then gradually to the eighteenth day, and then falling abruptly to a low level. In the last ten days (premenstrual) he found 10 per cent of conceptions, and no complete period of sterility. In the human being it appears that the period of ovulation may be variable, occurring most frequently in the first two weeks of the menstrual cycle. In view of such data the theory of a regular fertility-sterility rhythm in women cannot yet be generally accepted. New data concerning ovulation and conception may be made available in the next decade if careful records are kept of the histories of fertile couples who are willing to follow the Ogino-Knauss program. This may prove or disprove the theory of a sterility-fertility rhythm.

POST-TRAUMATIC EDEMA OF HAND

To the Editor:—July 3, 1933, a weaver in a cotton mill sustained a contusion in the palm of the left hand, getting it caught in the weaving machine. There was a good deal of reaction in the hand. No laceration was sustained. The reaction did not subside. Roentgenograms, which were taken later, revealed a small piece of steel near the head of the second metacarpal. This was removed by a physician, but the hand continued swollen, particularly along the course of the third metacarpal shaft and most apparent on the dorsum of the hand. This swelling has persisted to the present time. It has been incised twice and no pus obtained, the wounds healing promptly after each incision. Roentgen examination has always been negative for any bony pathologic changes. Foci of infection in the teeth were cleared over a year ago. The prostate was carefully checked by a competent genito-urinary man over a year ago. The tonsils are out and no suspicious tags remain. The Wassermann reaction is negative. General examination gives no other observations. Urinalysis is negative and the blood pressure normal. The patient is a former professional baseball player. At this time there is apparently a generalized swelling of the dorsum of the hand, apparently centered about the shaft of the third metacarpal. The patient complains and has always complained of constant pain, and the swelling is tender to pressure. There is some discoloration of a bluish character. Kindly omit name.

M.D., North Carolina.

ANSWER.—This patient is probably suffering from a group of symptoms, which, for want of a better classification, are grouped under the name "post-traumatic edema." The symptom complex is a fairly common one. It is not possible to state what produces it and how best to relieve it. There is no doubt that repeated additional traumatisms—operative incisions, infection, vigorous massage and excessive manipulation or use of the hand—can accentuate and prolong the disability. Sympathectomy has been advised by some surgeons, but since the exact cause of the symptoms is not known or its exact nature understood it is obvious that such treatment does not rest on any definite logical basis.

Soaking of the hand in warm water for fifteen minutes twice daily, gently washing the hand throughout that period with an abundance of soap suds (a form of simple and gentle massage) and gentle use of the hand have gradually brought about recovery in a certain number of cases. The best indication that such treatment is helpful is a gradual disappearance of the swelling, discoloration and pain. The margin between the most helpful degree of activity and excessive activity is slight, and the patient's impatience to secure improvement frequently leads him to excessive activity in the hope of bringing about recovery. Persistence of pain and swelling usually indicate that the patient is doing too much and that the hand needs more rest and less exercise.

TREATMENT OF TUBERCULOSIS

To the Editor:—A man recently came to my attention who developed signs and symptoms of incipient pulmonary tuberculosis a year ago. He was placed in bed for approximately three months. Following this he increased his exercise to the amount of becoming ambulatory. This was associated with a feeling of exhaustion, pleurisy pains, and a small amount of coughing. After approximately three months he returned to bed for five months. Recently he has resumed light work. This was followed by abdominal pains, distention and embarrassed breathing. A fairly clear straw colored fluid was removed by paracentesis. There has been a loss of weight of approximately 15 pounds (6.8 Kg.) recently. A few teaspoonfuls of soft cereal causes abdominal cramps. The evening temperature ranges from 38 to 39 C. (100.4 to 102.2 F.). What is the treatment indicated in this case? Can you suggest any articles or recent textbooks that deal with treatment of this phase of tuberculosis? Kindly omit name.

M.D., Washington.

ANSWER.—One would want to know whether there was any more evidence than signs and symptoms of minimal (incipient) pulmonary tuberculosis a year ago. Were x-ray films made of the chest? If there were only signs and symptoms available for making a diagnosis, the chances are approximately 80 to 20 that the disease already was moderately or far advanced, since signs and symptoms are usually late manifestations of pulmonary tuberculosis. To place this patient in bed constituted excellent treatment, provided x-ray films were made and collapse therapy, particularly artificial pneumothorax, was not indicated. However, if the disease was unilateral and even minimal (incipient) in extent, artificial pneumothorax, in addition to bed rest, should

have given him a much better prognosis. Three months of bed rest alone usually is not enough but might have been adequate had artificial pneumothorax been instituted.

The appearance of symptoms, such as exhaustion, chest pain and coughing when the patient became ambulatory, was excellent evidence that the disease was not under control. This should have been determined by periodic x-ray films, red cell sedimentation tests and differential white cell counts (according to the method of Medlar) before or while graduated exercise was being employed. Being ambulatory for three months certainly did the patient no good. While five months back in bed probably controlled the symptoms, periodic x-ray films and the tests just mentioned would have shown that the lesions were far from being under control. This is a typical history of the tuberculous patient who does not have anything more definite instituted in the beginning than strict bed rest. In every case of minimal, progressive, pulmonary tuberculosis, which is unilateral, artificial pneumothorax should be instituted, since it is the only method of bringing about adequate rest of the diseased part. Lying in bed gives the lung but little rest.

It would now appear that the patient has a definite tuberculous peritonitis. This usually is not a serious condition in itself and the outcome probably will depend largely on the pulmonary disease; that is, its extent, its progressiveness, and the treatment that is possible at this stage. Most certainly the patient should be on strict bed rest, and if the pulmonary disease has not progressed beyond the stage at which artificial pneumothorax is indicated it should be instituted at once.

Heliotherapy administered to the abdomen, through the use either of natural sunlight or of the mercury quartz vapor lamp, may aid considerably. In some cases oxyperitoneum is helpful. It consists of introducing oxygen or sterile air into the peritoneal cavity. Usually not more than 500 cc. is administered at one time. This can be done with ordinary artificial pneumothorax equipment.

The presence of abdominal cramps following a few teaspoonfuls of soft cereal is suggestive of tuberculosis of the intestine. Heliotherapy might prove beneficial also for this condition. All rough food should be removed from the diet. More detailed description of the treatment is to be found in the recent edition of "Pulmonary Tuberculosis," by Fishberg, published by Lea & Febiger, Philadelphia, and "Tuberculosis in the Child and the Adult," by Pottenger, published by the C. V. Mosby Company, St. Louis, 1934.

POISONING FROM SHOE DYE

To the Editor:—I have a patient who operates a shoe shining parlor and who apparently is developing an allergy to the dyes. The satin dyes come from the Omega Shoe Polish Company of Los Angeles, the black leather dyes from the Angelus Shoe Polish Company of Los Angeles, and the spray dyes from the S. & W. Corporation, Ltd., of Los Angeles. Could you tell me what these dyes contain? I intend to do a series of patch tests on the patient, but if any of these contain cyanide do you think it a safe procedure? If it is safe, what is the exact technic of testing? Please omit name.

M.D., California.

ANSWER.—In some skin clinics patch tests are carried out as a routine with shoe dressing material as a test agent. No reasons are known for apprehension when the quantity of these test materials is kept low. In one university clinic, records were found showing tests on one or more products of two of the companies specified in the query. However, it is pointed out that certain reactions after patch tests may reflect the effects of direct irritation rather than sensitization. No attempt has been made to detect the precise ingredients of the products of the companies mentioned; instead, reference is made to the constituents common to products of many manufacturers. Despite some protestations to the contrary, a fair number of shoe coatings still contain nitrobenzene as an ingredient, sometimes aniline, and possibly wood alcohol. The chemicals are, however, more important as sources of systemic disease rather than dermatoses. Orthodichlorobenzene is much used in shoe dyes. Aniline black is a well known coloring agent. Paraphenylenediamine and other diamines find some application in leather dyes. Hexanitrophenylamin is a dye often used for coloring cheap yellow leather shoes. In the *Deutsche medizinische Wochenschrift* (**52**:451 [March 12] 1926) is a report of cyanide poisoning from an American made shoe cleanser. Dyers of shoe leather, redyers of shoes such as in shoe-shine parlors, and occasionally wearers of dyed shoes are known to develop skin disorders caused by shoe dyes, solvents for such dyes, various resins, mineral and vegetable waxes, and greases entering shoe dressings.

The following is a simple method for patch testing: The skin area (usually the forearm or the thigh) is gently cleansed. A few thicknesses (two or three) of gauze about 1 inch square are prepared. On this gauze is placed the test material, either liquid, solid or semisolid. One drop is sufficient, particularly in the case of materials suspected of irritation. The rough equivalent of one drop represents the amount of solid or semisolid material to be applied in the test. At the same time, preparation should be made for blank or control tests. At times water in equivalent amount to the test material is used for control purposes. At other times only the gauze itself is utilized for control purposes. In any case these small squares should be covered over with rubber damming or equivalent impervious material. These somewhat larger squares of rubber damming should be held in place by adhesive plaster. Finally a few turns of bandage should be applied. At the end of twenty-four hours, observation should be made for evidences of skin irritation. Unless the irritation is distinctly greater for the test material than for the controls, the test should be regarded as negative.

INFECTION OF SKIN FROM MICA

To the Editor:—I am out on the Big Ditch, 17 miles from Riverside, Calif. We are building the last 7 miles, in Mocking Bird Canyon, through an old river bottom, and it is one wet job. We carry about 400 men on our rolls all the time. We do have one time with boils, and infection from mica. It will penetrate the hands, and after two days a terrible infection will develop. It acts in a peculiar way, seeming to bore right in through the skin and forming blebs, which swell up and fill with fluid in size from a dime to a quarter. We blame lack of care the men take of themselves for the boils, or rubbing of oil. Have you any sugestions? Where can I find discussion of the subject? I am interested how to prevent such occurrences.

ROBERT M. DODSWORTH, M.D., Perris, Calif.

ANSWER.—Mica is, or may be, similar to asbestos in its chemical nature. In the case of asbestos, it has been known that skin injuries after abrading contact lead to more than ordinary effects from mechanical injury. It is assumed that asbestos implanted in or beneath the skin exerts fibrogenic action such as is well known to take place in the lungs and peritoneum. A similar action possibly may be associated with mica, but this is not fully proved. It is not tenable to attribute "boils and infections" directly to mica. However, the cutting action of particles of mica may pave the way for the entry of infecting organisms.

California has the reputation of harboring a variety of fungus agents conducive to dermatoses. Because of the nature of the work described, invasion of the skin of the workers by mycotic agents is believed to be a reasonable possibility. On this account it is suggested that appropriate laboratory work be procured seeking the demonstration of the particular causative agent. In the meanwhile, as a preventive measure, it is believed that much may be gained by bettering the personal hygiene of the exposed workers. Thorough cleansing of the hands and forearms regularly should be obtained, possibly making use of disinfecting solutions. After thorough cleansing, with or without resort to disinfectants, nonirritating emollients should be applied to the skin. Prior to undertaking work and for the purpose of lessening the cutting action of mica particles, something may be gained by the application to the hands and forearms of workers small quantities of hydrous wool fat. Carbolized lanolin may prove to be superior to the unmedicated variety.

These lesions are initiated by mechanical action of fine mineral particles, into which there is a secondary invasion of either pyogenic or mycotic organisms.

PROTEIN PRODUCTS AND VASCULAR SPASM

To the Editor:—What products of protein decomposition cause vascular spasm? What products of protein decomposition cause vascular dilatation? Please omit name.

M.D., Connecticut.

ANSWER.—There is no specific product of protein that is known to cause spasm of the blood vessels. Excessive vasoconstriction of the peripheral vessels is seen in the course of some infectious diseases. Intravenous injection of foreign protein, with production of a chill and fever, may be followed by constrictive effects during the period of chill. This vasomotor reaction is not specific but is simply a part of the mechanism of the chill and fever reaction. The most common basis of spasm of the small blood vessels is a hyperreactive sympathetic vasomotor mechanism. The vasomotor centers overreact to different stimuli. This constitutional form of vasoconstriction is believed to be present in Raynaud's disease. An opposing view is that there is some abnormality in the smaller vessels. There is a large group of secondary forms of vasospasm that are seen in the course of other conditions such as neuritis, organic disease of the blood vessels and poisoning by heavy metals; such forms may be present also after disuse of an extremity or after trauma. In these recognized forms of abnormal vasoconstriction there is no reason to believe any protein is responsible.

Protein products may cause vasodilatation. Tissue extracts prepared from skeletal muscle, pancreas and heart muscle, when injected into the body, cause some degree of peripheral and general vasodilatation. There is widespread distribution of choline, which has vasodepressor effects, in tissues of the body. Histamine, an amine, may be found whenever protein is broken down into its amino acids, in the presence of putrefactive organisms. It is thus found in the intestinal tract and also in the tissues of the body. Histamine, or substances closely allied to it, may be released from the skin of certain subjects by cold. This may produce edema of the skin and typical systemic vasodepressor effects similar to those seen after the injection of histamine.

POSSIBLE CYST OF OVARY

To the Editor:—Mrs. C. C., aged 45, was operated on when she was in her late twenties. The nature of the operation she does not know, except that her ovaries were removed and that she has not menstruated since she was about 30. This is the best information she can give. Before the operation she gave normal (?) birth to one child, who is still alive. In 1934 she slipped on an icy pavement, injuring her left side. She was dizzy following the fall, had severe pain in the left utero-ovarian region, and was confined to bed for six weeks. One month after the fall she had a profuse flow of blood from the vagina, which lasted for one day and has not recurred. At present there is felt a mass about the size of an orange in the left ovarian region. The nature of the mass has not been determined. The woman feels fairly well and has gained weight. Hypothetically, is it possible that she sustained a hematoma in the left pelvic region following the fall, that some of the blood escaped through the vagina a month later, and that an organized clot is still present in that side? Kindly omit name.

M.D., New York.

ANSWER.—The information concerning this case is incomplete. The statement is made that the patient was operated on when she was in her late twenties and an additional statement gives the information that the patient ceased menstruating when she was about 30 years of age. Presumably menstruation continued for a short time after the operation. If this is so, either both ovaries were not entirely removed or there existed some additional ovarian tissue outside the two ovaries.

While a hematoma in the left pelvic region may have resulted from the fall, it is hardly likely that this blood could have found its way into the vagina unless there existed a perforative injury on the left side of the vagina or the hematoma caused pressure necrosis at some point in the vagina. A more probable condition is a cyst of the remaining ovarian tissue. This cyst was most likely present before the accident. The latter may have resulted in injury to the cyst and in some way the mechanical insult to the cyst brought about bleeding from the uterus. The mass may be a special type of tumor of the remaining ovarian tissue. This group includes granulosa cell tumors, arrhenoblastomas, disgerminomas and Brenner tumors. Some of these tumors induce bleeding in the uterus many years after the menstrual flow has ceased. In the presence of such tumors, no accident is necessary to bring about bleeding from the uterus. If the mass grows, bleeding recurs or there is pain and tenderness in the mass, it should be removed.

MIGRATING PHLEBITIS

To the Editor:—I am treating a convalescent from lobar pneumonia and am quite puzzled by complications I have never seen before. She has multiple phlebitis over her entire body and all four extremities. She gives a history of having had the same thing about a year ago, but at that time the phlebitis developed independently of any disease. She has an old myocarditis but no endocarditis as far I can make out.

D. STODDARD DOOMAN, M.D., Garden City, N. Y.

ANSWER.—Migrating phlebitis is mostly regarded as a low-grade systemic infection, in which the intima of the vein is abnormally vulnerable or perhaps sensitized to a bacterial or toxic agent. The fact that the patient had multiple thromboses once before and has had a recurrence after pneumonia permits the assumption that the recent infection has acted as a sensitizer or reactivator of a slumbering process. Pneumonia per se is sometimes followed by thrombosis, as changes in the composition of the blood, such as increase in fibrinogen, produce a tendency to clotting of the blood.

The treatment is not very satisfactory. The disease runs its course and may end in a bland obliteration of the affected segments or may involve other segments and produce emboli. Every effort should be made to recover the organism from the blood stream or from an excised thrombotic vein so that a vaccine can be prepared. Minimal doses of this vaccine should be given so as to avoid general reactions or chills. In the absence of a specific vaccine, triple typhoid vaccine may be administered cautiously, from 100,000 to 1,000,000 bacteria being given intravenously, twice a week. Intravenous antiseptics have been advocated from time to time, more recently gentian violet. Perhaps the best and certainly harmless is 40 per cent solution of methenamine, which can be given in 5 to 10 cc. doses daily. Needless to say, a satisfactory water intake and the maintenance of vitamin and mineral balance are important.

DERMATITIS

To the Editor:—A woman, aged 43, complained of severe itching of the face and neck, with some redness of the face and neck and swelling of the face. There was large vesiculation, with breaking of the vesicles. The rash extended to the chest and the back of the neck. The skin was flushed and there was a maculopapular type of rash with some small area on the neck, which formed scaly patches almost like a crust. There was a maculopapular rash on the flexor surface of the lower arms and papules closely grouped on the dorsal surface of several of her fingers on the second phalanx. The rash is a dusky pink. The patient has been upset and nervous since the rash appeared and cannot sleep well because of the itching and burning. Scratching seems to bring out more papules, which are light pink or the color of the skin. She has developed several boils on the back of the neck and in the axilla. Can you suggest a diagnosis from this history? Please omit name.

M.D., Alabama.

ANSWER.—The description suggests a dermatitis from some external contact. Does the patient have any house plants or has she handled paints or insect powder lately? All contacts, and there are many possibilities, should be investigated. Patch tests of cosmetics, cooking materials, feathers in pillows, and so on may be made, a small amount of the suspected material being placed on the uninvolved skin under a piece of oiled paper or gutta percha, fastened with adhesive plaster, and allowed to remain two days, provided itching does not occur in less time than that. If a dermatitis develops under any patch in two days or less, this substance should be retested and, if again found positive, removed from the environment.

Scratching must be prevented, best by giving an antipruritic lotion to apply when itching occurs. Solution of aluminum acetate, 1 : 16, in cool water, as thin wet dressings alternating with calamine lotion with 0.5 per cent phenol are as good as any; but the patient's choice should determine the treatment as a rule. For the nervousness, bromides may be given by mouth or intravenously. The treatment of such cases is often difficult, as is the determination of the exciting cause.

The boils were secondary to the dermatitis, which caused a locus minoris resistentiae.

SILICOSIS NOT A SERIOUS HAZARD IN CAST IRON FOUNDRY

To the Editor:—I have been doing the insurance work for a cast iron foundry for several years and would appreciate any information that you might give me regarding the danger of silicosis in men engaged in cleaning and polishing castings. After the castings are made they are put in a revolving machine, called a rattler, to shake the excess sand and loose iron from the surface. They are then polished on emery wheels. How much danger is there of silicosis developing in men who have done this work for years, and what would be the best way of keeping down this dust? Would early silicosis show on x-ray plates? Please omit name.

M.D., Virginia.

ANSWER.—There is no reason why men engaged in cleaning castings and in tending machinery used for this purpose should be subjected to silicosis-producing dusts in harmful concentrations. Prevention of dust inhalation is an accomplished fact in many well conducted foundries, and improper conditions can be corrected by wholly practical devices (McConnell, W. J., and Fehnel, J. W.: *J. Indust. Hyg.* **16**:*227* [July] 1934. McCord, C. P.: Pamphlet published in 1932 by the National Founders Association, Chicago).

Cleansing sand from castings by sand blasting or shot blasting is a recognized silicosis hazard entirely avoidable with modern equipment. Chipping off burrs and irregularities from sandy castings is likewise a practice that may cause silicosis and is readily avoidable.

The polishing of sand-free castings on emery wheels is standard foundry practice. The wheels gradually wear down, so that some finely divided abrasive and some iron dusts are thrown into the air. Neither of these dusts alone has been shown to cause silicosis. Information from the Norton Company, Worcester, Mass., is available on the design of dust exhausts for use with artificial abrasive wheels of all types. Such exhausts improve the working conditions.

Undoubtedly there is a silicosis hazard in the foundry that is conducted carelessly. At present the only method available for diagnosing early silicosis is by x-rays, and the foundry industry, like any other industry with a possible silicosis risk, should require periodic roentgen examinations of men with suspected dust exposure (Gardner, L. U.: The Pathologic Reaction in Various Pneumoconioses, THE JOURNAL, Aug. 19, 1933, p. 594. Pancoast, H. K., and Pendergrass, E. P.: Roentgen Technic with Especial Reference to Examination to Diagnose or Exclude Silicosis, *J. Indust. Hyg.* **16**:165 [May] 1934).

SINUS ON BRIDGE OF NOSE

To the Editor:—A boy aged 12 years, has a discharging sinus on the bridge of the nose; it has been present since birth. At times no drainage will occur for days or weeks; then the nose and forehead will swell markedly over the base of the nose and inner half of each supra-orbital region. If the swelling is opened or allowed to open spontaneously, pus and mucus drainage occurs and the swelling disappears. Then for days or weeks a slight drainage is present. During the time of drainage, no other symptoms are present. I have tried injecting the sinus with Beck's paste and roentgenographing but I get a poor outline of the tract. The damming up caused by the paste causes swelling, headache, some fever and general toxemia. I thought the paste might aid in the healing process. Branchial cleft and dermoid cyst with sinus occur to me as likely diagnoses.

B. B. PARKER, M.D., ALLERTON, IOWA.

ANSWER.—The condition described is obviously rare. These fistulas have their openings high, as a rule, and may be followed downward to the lower end of the nasal bone or farther. They end nearly always blindly, not communicating with the nasal cavity. They may be classified as primary or secondary and when secondary usually are due to opening by a physician or to the spontaneous bursting of a dermoid cyst. The primary fistulas cannot be easily explained. One authority believes that the most likely cause is the improper closure during fetal life of the median nasal cleft, with possibly the capture of some amniotic membrane.

As to further diagnostic efforts, one might inject oil diluted one half with olive oil to avoid reaction and follow by roentgen examination.

Treatment rests between surgical extirpation and the use of some sclerosing preparation, as a modified Carnoy's solution (Cutler, E. C., and Zollinger, R. M.: Use of Sclerosing Solutions in Treatment of Cysts and Fistulas, *Am. J. Surg.* **19**:411 [March] 1933). Surgical removal would have to be complete. A small remnant of the tract left behind would in all likelihood cause a recurrence of the fistula. The use of a solution, as suggested, would probably be followed by painful reactions and would have to be repeated more than once and with proper safeguards.

BURSITIS

To the Editor:—A man, aged 55, whose weight was between 233 and 240 pounds (106 and 109 Kg.), blood pressure 168 systolic, 90 diastolic, and urine examination always normal, had negative past history except for rheumatic pains. Aug. 25, 1934, he struck his knee against an icebox and did not think much of the injury at the time, although the knee felt sore and he limped. September 5 he complained of pain in the knee and in various joints. He was given large doses of sodium salicylate and a bandage was applied to the knee, which contained no fluid at that time. The patient continued to work in a store. October 18, 20 cc. of syrupy fluid was withdrawn from the bursa under the quadriceps tendon above the patella. This was not connected with the knee joint. November 17, 25 cc. of the thick fluid was aspirated. November 19, 25 cc. was aspirated and the knee was put in a plaster cast. The cast was removed, December 20, and 15 cc. of fluid was aspirated and the cast reapplied. The fluid was aspirated Jan. 8 and 18, 1935. Following the last aspiration no fluid appeared and the knee felt well until February 28, when 25 cc. of the thick fluid was aspirated and about 10 cc. of salt solution injected. The knee was then tightly bandaged and the patient was told to remain in bed. He has not worked since early November. I have been anxious to inject the cavity, which has been shut off from connection with the joint, but have been advised not to, taking the last aspiration when the salt solution was injected as my own tryout. A surgeon advised against removal of the sac. Please omit name.

M.D., New Jersey.

ANSWER.—The case in question is classed as synovitis of the bursa, or bursitis.

It is probable that surgery, including synovectomy or bursectomy, will be necessary, but before this procedure is carried out the elements of trauma, infection and allergy should be investigated as thoroughly as possible; otherwise recurrence might follow.

REMOVAL OF SILVER DEPOSITS FROM SKIN

To the Editor:—In THE JOURNAL, May 11, page 1771, is a query from a doctor in Massachusetts about silver deposits on the skin. From the answer I judge that it was assumed that the deposit was below the epidermis. It is perfectly easy to remove superficial silver deposits by soaking the hands in a mixture of equal volumes of 25 per cent sodium hyposulphite (the ordinary hypo) and 10 per cent potassium ferricyanide. This is Farmer's reducer used in photography and is safer than the other effective mixture, which is tincture of iodine followed by a dilute solution of potassium cyanide. The latter is dangerous except in the hands of experts who know enough not to dip their fingers into potassium cyanide if there are any cracks on them. Ordinary tincture of iodine is satisfactory and a 5 per cent cyanide solution is strong enough and will remove the silver iodide produced by the action of the iodine on the silver sulphide.

FRANCIS CARTER WOOD, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Dec. 7. *Applications must be filed not later than Nov. 1.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: The Cincinnati examination previously announced will not be held. The next examination will be given in St. Louis, Nov. 18. *Application must be filed before Sept. 15.* Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: St. Louis, Jan. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Cincinnati, Sept. 14. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Philadelphia, Oct. 10 and St. Louis, Nov. 20. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF RADIOLOGY: Detroit, Dec. 1-2. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, Sept. 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, Oct. 1-2. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: Sacramento, Oct. 21-24. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 1. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

GEORGIA: Atlanta, Oct. 8-9. Joint-Secretary, State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

IDAHO: Boise, Oct. 1. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 22-24. Act. Supt. of Regis., Dept. of Regis. and Edu., Mr. Clinton P. Bliss, Springfield.

MICHIGAN: Lansing, Oct. 8. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 1-2. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 15-17. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MONTANA: Helena, Oct. 1. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, Sept. 16-18. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEW HAMPSHIRE: Concord, Sept. 12-13. Sec., Board of Registration in Medicine, Dr. Charles Duncan, State House, Concord.

NEW JERSEY: Trenton, Oct. 15-16. Sec., Dr. Arthur W. Belting, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 14. Sec., Dr. Le Grand Ward, Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 16-19. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

RHODE ISLAND: Providence, Oct. 3-4. Dir., Department of Public Health, Dr. Edward A. McLaughlin, 319 State Office Bldg., Providence.

WISCONSIN: *Basic Science.* Madison, Sept. 21. Sec., Professor Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, Oct. 7. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

Mississippi June Report

Dr. Felix J. Underwood, executive officer, Mississippi State Board of Health, reports the written examination held in Jackson, June 25-26, 1935. The examination covered 12 subjects and included 96 questions. An average of 75 per cent was required to pass. Thirty-one candidates were examined, 30 of whom passed and 1 failed. Ten physicians were licensed by reciprocity and 1 physician was licensed by endorsement. The following schools were represented:

School	Year Grad.	Per Cent
PASSED		
Emory University School of Medicine	(1935)	81, 81.1, 86, 86.1, 86.7
Louisiana State University Medical Center	(1935)	82.8*
Tulane University of Louisiana School of Medicine	(1931) (1935)	84.9, 80.6, 82.4, 82.5, 84.6, 84.7, 84.8, 86.5, 86.8, 87.4, 87.9, 88.6, 88.7, 89, 89.2
Meharry Medical College	(1934)	77.4
University of Tennessee College of Medicine	(1934) (1935)	80.5, 76.9, 81.3, 81.6, 83.2
Vanderbilt University School of Medicine	(1935)	85.3, 85.9, 86.4
FAILED		
Nongraduate †		47.4

School	Year Grad.	Reciprocity with
LICENSED BY RECIPROCITY		
Emory University School of Medicine	(1932, 2)	Georgia
University of Louisville School of Medicine	(1928)	Kentucky
Tulane University of Louisiana School of Medicine	(1933)	Louisiana
Duke University School of Medicine	(1933)	Alabama
Meharry Medical College	(1907), (1933)	Tennessee
Univ. of Tennessee College of Medicine	(1932), (1934, 2)	Tennessee

School	Year Grad.	Endorsement of
LICENSED BY ENDORSEMENT		
Northwestern University Medical School	(1934)	N. B. M. Ex.

* This applicant has received an M.B. degree and will receive an M.D. degree and Mississippi license on completion of internship.

† Permitted to come before the board for examination by special act of the legislature.

Virginia June Examination

Dr. J. W. Preston, secretary, Virginia State Board of Medical Examiners, reports the written examination held in Richmond, June 19-21, 1935. The examination covered 8 subjects. An average of 75 per cent was required to pass. Ninety-nine candidates were examined, 98 of whom passed and 1 failed. Eleven physicians were licensed by reciprocity and 1 physician was licensed by endorsement after a written examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1934)	82
Howard University College of Medicine		(1934)	86
Cornell University Medical College		(1934)	89
University of Pennsylvania School of Medicine		(1935)	82
Medical College of Virginia		(1934)	81, 82, (1935) 78, 78, 80, 80, 80, 81, 81, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 84, 85, 85, 86, 86, 86, 86, 86, 87 87, 87, 88, 88, 88, 88, 88
University of Virginia Department of Medicine		(1935)	76, 78, 79, 79, 80, 80, 82, 82, 83, 83, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 87, 87, 87, 87, 87, 87, 88, 88, 88, 88, 89, 89, 89, 90, 90, 90, 93
Osteopaths			75, 81, 84, 84

School	FAILED	Year Grad.
Leonard Medical School, N. C.		(1910)

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1930)	Colorado
Howard University College of Medicine		(1933)	Missouri
National Medical College, Chicago		(1897)	Alabama
University of Kansas School of Medicine		(1927)	New York
Univ. of Maryland School of Medicine and College of Physicians and Surgeons		(1932)	Maryland, (1933) N. Carolina
Long Island College of Medicine		(1933)	New York
University of Pennsylvania School of Medicine		(1932)	Wisconsin
Meharry Medical College		(1934)	Tennessee
University of Tennessee College of Medicine		(1922)	Tennessee
Medical College of Virginia		(1924)	W. Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Duke University School of Medicine		(1933)	N. B. M. Ex.

Book Notices

The Treatment of Fractures. By Dr. Lorenz Böhler, Director of the Hospital for Accidents, Vienna. Fourth English edition, translated from the fourth German edition by Ernest W. Hey Groves, M.S., M.D., F.R.C.S., Consulting Surgeon, Bristol General Hospital. Cloth. Price, $12. Pp. 578, with 1,059 illustrations. Baltimore: William Wood & Company, 1935.

Previous editions of this book in German and French have been reviewed in THE JOURNAL. The qualifications of the author are excellent. Hey Groves, the translator, has contributed much to the principles and practice of the treatment of fractures. Few books on the subject have presented the material as clearly and concisely as this one. Almost none have had the large number of beautiful and instructive illustrations. The book represents the outcome of the experience of nineteen years of treatment of more than 10,000 cases of fractures, the study of about 70,000 roentgenograms and the dissection of more than 300 fractures of the long bones chiefly during the war. The author has treated fractures under the most diverse conditions. The results of the treatment of fractures depend not merely on the use of certain appliances and methods but even more largely on the education of the surgeon and the organization of the clinic. The fundamental principles demonstrated by Böhler are the necessity for unity of control, loyal and efficient team work, accurate knowledge of the after-results and meticulous attention to details. Böhler has demonstrated that the proper treatment of fractures is not only a scientific problem and philanthropic duty but also a business proposition. The translator states that "it pays" to treat fractures well. The new material in the English edition deals with the anatomic conditions and the treatment of fractures and fracture-dislocations of the cervical spine that have been revised in the light of recent experience. The section on the calcaneus has been thoroughly revised, as a follow up of the cases has shown that reduction by the Phelps-Gocht clamp with tenotomy of the achilles tendon has not given good results owing to the recurrence of displacement. There is a section dealing with "mistakes," which has been elaborated for each type of fracture because it is possible to avoid these only by studying the mistakes already made by others; and some of the procedures that Böhler formerly advised he now relegates to the category of "mistakes." It would require too lengthy a review to go into details concerning the treatment of particular fractures. The reader will be well repaid for reading this book. One can easily understand why Vienna is a mekka for young and old practitioners and students of the art and science of the treatment of fractures. When the history of fractures is written, Böhler's name will appear prominently, establishing a Böhler era or milestone. This book will rank high with all traumatic, orthopedic and general surgeons.

Emotions and Bodily Changes: A Survey of Literature on Psychosomatic Interrelationships, 1910-1933. By H. Flanders Dunbar, M.D., Ph.D., Departments of Medicine and Psychiatry, Columbia University. Published for the Josiah Macy, Jr., Foundation. Cloth. Price, $5. Pp. 595. New York: Columbia University Press, 1935.

The relationship of the body to the mind and vice versa has been the subject of much study by the psychiatric, psychoanalytic and medical groups. The present volume is an attempt to bring together some of the vast research material that has been reported in the literature. Of the author's ideas concerning the mind-body relationship there is little direct information, for the book is a systematic collection of abstracts, rather than a thesis, concerning the problem at hand. It is possible, however, to perceive that the author agrees with leading psychiatrists and psychoanalysts that much can be done with the so-called physical disorders by means of psychologic treatment and that such treatment is as "scientific" as any other medical therapeusis. On the other hand, many psychologic symptoms are conceded to rest on a physical basis. In the first of the three sections of the book the development of mind-body theories is brought out, including an excellent discussion (by means of abstracts of articles) of methods of measuring the emotions. Part II takes up the changes in the nervous, respiratory and cardiac systems due to emotional action and interaction, stress being placed on metabolism. The third part comprises a short section on therapy. The final quarter of the book consists of a thorough bibliography. There are many items in the bibliography that are merely mentioned in the text of the book. The bibliography is of as much value to the student as the main part of the book. The present work should be stimulating to any one who wishes to orient himself in the psychologic aspect of disease. With psychoanalysts relieving sufferers from gastric ulcer and psychiatrists furnishing some of the theory for treating asthma and functional heart disease, the author's point is well taken when she says: "Psychiatry . . . is finding its place within medicine on the same basis as any other specialty" and "Psyche and soma are . . . actually two aspects of a fundamental unity." The volume gives evidence of much insight, brilliance and extensive research into the literature and may well serve as a crystallizing influence in the field of mental medicine.

Handbuch der ärztlichen Sachverständigen-Tätigkeit. Herausgegeben von Professor Dr. Paul Dittrich. Band VI, Teil 2: Der Kindesmord in der ärztlichen Sachverständigen-Tätigkeit. Von Professor Dr. Paul Dittrich. Boards. Price, 10 marks. Pp. 118, with 50 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1935.

This is the second part of the sixth volume of a handbook on the activities of physicians as experts, published with the assistance of the department of public health of the republic of Czechoslovakia. It deals with the medicolegal aspects of murder of the new-born. Full directions are given for the examination of new-born bodies under various conditions (thirty-five pages). The next section is devoted to the legal enactments concerning the crime in question in Austria, Germany and Czechoslovakia and to the determination of how long a dead infant may have lived after it was born. Then are considered the causes of death in the new-born—death before birth, death in the course of birth, natural death after birth, and violent death after birth. The other sections concern the kinds of murder of the new-born, intentional neglect and exposure of the new-born, and illustrative postmortem examinations with reports. The illustrations tell their story well. The presentation is clear, thorough, competent. It will be of service to the physician-expert when he is required to aid the course of the law against taking the life of the new-born.

Diet Control: A System of Eleven Hundred Diets for the Prescription of Diabetic, Anti-Obesity and Measured Diets in General. By George E. Anderson, M.D., Attending Physician to the Brooklyn Hospital, and Paul Chadbourne Eschweiler, M.D., Assistant Attending Physician to the Brooklyn Hospital. Cloth. Price, $3.50. Loose-Leaf. New York: Gallo & Ackerman, Inc., 1934, 1935.

This contains twenty pamphlets, one of which is explanatory of the diabetic diet system employed by the authors while the remaining pamphlets are intended to be distributed to individual patients as diet prescriptions. This particular system is built on a "basic diet" (1,085 calories: carbohydrate 100, protein 70, fat 45) which supports the principle of high carbohydrate-low fat diets generally advocated today and contains the minimum food essentials for optimum needs in the form of calcium, phosphorus, iron, protein, protective foods and vitamins. These are supplemented by additional carbohydrate, protein and fat units in accordance with a sliding scale of caloric values to meet the varying tolerance of the patients. Frankly, this is one of the most satisfactory schemes of diet that have been suggested. Its merits include a minimum of calculation and explanation on the part of the physician, while the patient is allowed a wide variety of food choice and the advantage of using common household measurements. Incidentally, the basic diet also serves as an antiobesity regimen. The publication is primarily intended for patients in the Brooklyn Hospital, where the system originated and where instruction is given the patient during hospitalization, but it is worthy of the critical consideration of all physicians in the diabetic field.

Klinik und Therapie der Herzkrankheiten: Vorträge für praktische Ärzte. Von Privatdozent Dr. D. Scherf, Assistent der I. medizinischen Universitäts-Klinik in Wien. Paper. Price, 6.60 marks. Pp. 210, with 10 illustrations. Vienna: Julius Springer, 1935.

This little volume of lectures for general practitioners deserves translation into English. It is replete with fundamental physiologic and clinical facts concerning the heart and the circulation. The introductory discussion of dyspnea and other symptoms and signs of cardiac insufficiency is a model of accuracy and lucidity. The diagnosis and differential diagnosis of the various types of heart disease are then treated briefly but exceedingly well. One regrets that, for lack of space, the author omitted discussion of congenital heart disease, pericarditis, bacterial endocarditis and the arrhythmias. The section on treatment is a store of clinical experience and wisdom, with one minor exception. This is a shot-gun mixture of all the known vasodilators and other substances, which the author administers to patients with angina pectoris. The chapter on digitalis therapy is admirable. Although the author has purposely omitted references to the literature, he has succeeded in bringing into his lectures all the recent contributions of worth in the field of cardiology. Physicians who study this book carefully will acquire a real enthusiasm for the diagnosis and treatment of their cardiac patients.

The Individual Criminal: Studies in the Psychogenetics of Crime. By Ben Karpman, M.D., Psychotherapist, St. Elizabeths Hospital, Washington, D. C. Volume I: Cases 1-5. Nervous and Mental Disease Monograph Series, No. 59. Cloth. Price, $4.50. Pp. 317. Washington, D. C.: The Nervous and Mental Disease Publishing Company, 1935.

This volume is an earnest bit of work consisting of a minute analysis of five criminal cases, all from St. Elizabeths Hospital, and hence all under the cloud of mental disease. The cases are each analyzed from the standpoint of the past experiences of the offender, and to the author's interpretation of factors concerned in the case he adds a second discussion consisting largely of a differential diagnosis. The cases are not typical either of the everyday offender or of the psychotic. They are borderline cases, diagnosed with difficulty and probably with some psychoneurotic substrata, a feature much overstressed by those who know psychiatry but not criminals. Each case is interesting because much of the "interpretive" part consists of a running life story. Nevertheless, sociological documents such as the "Jack Roller" seem to be of more significance in revealing the mental mechanisms of criminals and the etiologic factors entering into them. At the end of each study is an analysis called a "psychobiopsy" showing the author's opinion regarding salient features of the patient's life. There are three sections entitled "crime mechanics," dealing with crime in general, apparently written in part by an inmate revealing little that is new and in places showing much of the stereotype thinking of the chronic offender. Some of the author's dreams and other interpretations are valuable, but there are many statements of psychiatric definition and explanation that are extremely dubious. There is a section on criminal jargon that would only be in part recognized by the hardened offender. If one accepts this book not as a presentation and analysis of five nontypical offenders but as an exposé of the problem of crime in relationship to psychology, it leaves something to be desired. It would perhaps be more convincing if the cases were selected from a prison, and if the details regarding the obtaining of *rapport* were presented. There are two vast maps inside the back cover, which are not of great value. The volume is apparently intended to be part of a bigger work and it may be that, integrated with a broader study, it could become a distinct contribution.

Monographien aus dem Gesamtgebiet der Physiologie der Pflanzen und der Tiere. Herausgegeben von M. Gildemeister, R. Goldschmidt, R. Kuhn, J. Parnas, W. Ruhland und K. Thomas. Band XXXIII: Der Wasserhaushalt des gesunden und kranken Menschen. Von Dr. Hellmut Marx, Privatdozent an der Universität Berlin. Paper. Price, 27 marks. Pp. 335, with 52 illustrations. Berlin: Julius Springer, 1935.

Marx has presented probably the most comprehensive consideration of water metabolism in health and disease that can be found anywhere. In the first chapter he discusses the property of water and its importance to the organism; in the second, the method employed in the studies of water metabolism; in the third, the rôle of various organs in water metabolism; in the fourth, water in relation to edema; in the fifth, water in relation to output; in the sixth, the regulation of the water balance of the body and the part played by the cerebral centers, the midbrain and the hormones; in the seventh, the physiology of thirst. The bibliography is excellent. From both the physiologic and the clinical point of view a wealth of material is presented. The volume should prove of interest and value to students of metabolism in the laboratory and the clinic. It will probably constitute a standing contribution to our knowledge of this subject.

Principles of Ethics. By Dom Thomas Verner Moore, Ph.D., M.D., Director of the Clinic for Mental and Nervous Diseases, Providence Hospital, Washington, D. C. Lippincott's Nursing Manuals. Cloth. Price, $3. Pp. 381. Philadelphia and London: J. B. Lippincott Company, 1935.

This is based on a theistic philosophy covering a wide range of individual and social relationships. It gives a free interpretation of moral rather than medical ethics from the point of view of a selective group. It expounds the behavioristic as well as the debatable questions of contraception and abortion. Its greatest value is its use as a reference work rather than as a textbook in dealing with the daily problems of nurses. The standpoint toward craniotomy is one that will interest surgeons as well as obstetricians. The book throughout has an arousing interest in the old philosophers, especially the concluding chapters, which are rather an abrupt departure from the preceding ones. The literary style is modern and lucid, making it easy to read instead of onerous, as are most books of this kind. The value of the volume lies in the clear exposition of deeply rooted theistic theories forming the framework and background of principles of ethics that influence moral and medical decisions of many people.

Studies on the Dissociation of the Dysentery Bacilli. By Erik Waaler, from the Bacteriological Laboratory of the Norwegian Army. Paper. Price, 18,50 kronor. Pp. 176, with 53 illustrations. Oslo: Jacob Dybwad, 1935.

This monograph gives the results of a detailed study of the dissociation forms of twenty-six strains of dysentery bacilli, mostly of the Flexner and Sonne types. The variants are classified chiefly by their antigenic behavior. Much of the discussion is of too technical a character to appeal to any but special students of the dissociation problem. Two points of general interest may be mentioned: First, a new variant derived from R forms is described which produces no antibodies when injected into rabbits; it is designated as R_a. Second, the processes of dissociation in the strains studied by Waaler have taken place in one direction only: from S to R and further to R_a; no antigenic reversion was observed.

The Method of Action of Radium and X-Rays on Living Tissues. By Hector A. Colwell, M.B., Ph.D., M.R.C.P. Awarded the Garton Prize and Gold Medal of the British Empire Cancer Campaign, 1934. Cloth. Price, $5. Pp. 164, with 34 illustrations. New York & London: Oxford University Press, 1935.

In this comparatively small volume the author deals with the various phases of radiation effects on living tissues, including biologic, serologic and histologic aspects of the problem. The first chapters are devoted to the effects of radiation on cells and their components, to the chemical action of radiation, and to the influence of radiation on the reticulo-endothelial system and on the immunity actions of the body. The most important chapters deal with the effects of radiation on tumor growth and on resistance to tumor growth, and the action of radiation on living tumors. It is impossible in a short review even to signify the full content of this fascinating book. Although the author has to discuss a number of special questions, he never loses the broad general biologic view. The book meets a need and not only is it a convenient guide for the experimental worker but it gives to the clinical radiologist who wishes to administer his treatments with an intelligent understanding a real scientific and critical basis. A short bibliography is appended.

The Newcastle upon Tyne School of Medicine, 1834-1934. By G. Grey Turner. Assisted by W. D. Arnison. Cloth. Price, 10/. Pp. 224, with 50 illustrations. Newcastle upon Tyne: Andrew Reid & Company, Ltd., 1934.

On the one hundredth year of its founding, the authors attempt to give a chronological account of the history of this famous school, which changed both name and habitation often. In doing so the authors admittedly rely heavily on "The History of the Medical School," published forty years ago by Dennis Embleton. However, many new additions are said to have been made by a great number of credited contributors. An introductory poem by Maurice Jacobs recounts some of the illustrious men of the faculty, not least of whom is Murray, who first successfully treated myxedema by means of thyroid. Throughout the volume are short biographic sketches of the various teachers in the medical school during the past hundred years as well as the names of some of the students. One of the latter, John Snow (p. 20), deserves more mention than allotted him, for he was not only himself "a skilled chloroformist" and etherist but it was he who put the administration of both chloroform and ether on a truly scientific basis.

Introduction to Psychology with Special Applications to Nursing and Nursing Problems. By Edward S. Robinson, Professor of Psychology, Yale University, and Virginia Kirk, Director of Nursing, Emma Pendleton Bradley Home, East Providence, R. I. Cloth. Price, $2.50. Pp. 368, with 55 illustrations. New York: Macmillan Company, 1935.

Most of the material of this book is taken from the senior author's Readings in Psychology and put in more popular style for consumption by nurses. The work is not intended for physicians or specialists. As a textbook for nurses it seems to assume too great an academic point of view. The academic psychologist as evidenced by this and other works seems far removed from the living human being with his complicated emotional life and environmental stresses. To the extent to which this is true, the volume fails to meet the real needs of the nurse. It has, however, a fairly elementary and readable summary of current psychologic data.

A Brief Outline of Modern Treatment of Fractures. By H. Waldo Spiers, A.B., M.D., Professor of Orthopaedic and Fracture Surgery, College of Medical Evangelists, Los Angeles, California. Cloth. Price, $2. Pp. 129, with 109 illustrations. Baltimore: William Wood & Company, 1935.

In this outline the author aims to touch only the high spots and their practical application. He discusses briefly some of the more recent accepted methods of treatment and presents the fundamental principles of fracture surgery. All the illustrations are line drawings and most of them are instructive. The secret in the treatment of many cases that appear to present delayed union is to give the reparative process more time. The author states that in one's haste to do things in new and radical ways one gets patients out of the hospital and on their feet and may not immobilize sufficiently. He outlines the factors that contribute to nonunion as failure to immobilize, interposition of soft tissue, ill advised operative procedure, insufficient circulation, dietary deficiency and certain diseases. The fundamentals of the surgical treatment of nonunion are removal of scar, both soft tissue and bony; freshening of the ends of the fragments; fixation of the fragments—internal, external or both, and stimulation of bone regeneration by grafts, osteoperiosteal grafts or multiple drilling. He advises the surgeon to roentgenograph all fractures after reduction and to retain the films himself, to roentgenograph all suspicious injuries, to be prepared to release easily and quickly all constricting circular casts or bandages on an extremity, to protect the fracture until union is firm, to take the responsibility seriously and, if in difficulty, to call skilled consultation early. Brief criticism is justified as follows: Figure 67 was undoubtedly taken from G. G. Davis's Applied Anatomy and figure 97 from R. Watson Jones without due credit being given. All in all, it is a satisfactory book for the medical student.

Miscellany

ANTEPARTUM GROUP INSTRUCTION

RICHARD A. BOLT, M.D., DR.P.H.
Director, Cleveland Child Health Association
AND
ELLA GEIB
Secretary to Director
CLEVELAND

Antepartum group instruction in Cleveland was initiated in 1922 by Mrs. Ellen D. Nicely, R.N., Nurse Director of Clinics, in the University Public Health Nursing District. The time of groups of mothers, awaiting their turn to interview the doctor in the clinic, was occupied in listening to the nurse as she explained in simple language matters of hygiene, nutrition, clothing and infant care.

The program was developed further under the Cleveland Health Council, and when its value had been demonstrated it was taken over by Maternity Hospital in 1929. This made possible the extension of group instruction in the eight maternity dispensaries throughout the city and in three other hospital clinics. Owing to contraction of funds in 1932, the Maternity Hospital was unable to continue the program. It then came under the direction of the Cleveland Child Health Association, which raised special funds for this purpose. The service was expanded and a second nurse was employed to assist in the program.

TO WHOM SERVICE IS OFFERED

The lectures now are open to any woman in Greater Cleveland who wishes to avail herself of the advantages of the classes. Until 1932 the lectures were given only to "clinic" or "free" patients and were conducted in hospital clinics. During 1932 an experimental class for the patients of private physicians was started in the Academy of Medicine of Cleveland. This proved so successful that several more classes for the patients of private physicians have been opened.

HOW PATIENTS ARE RECRUITED

Contact with clinic patients is made in hospital obstetric clinics on antepartum clinic days. The class usually precedes examination by the physician. Mothers coming to these clinics automatically attend the antepartum classes.

Patients of private physicians are instructed in classes separate from clinic patients. These are located in the Academy of Medicine of Cleveland, hospitals, recreation centers, and branch stations of the Visiting Nurse Association. Patients come to the classes through reference of their own physician, recommendation of former patients who have attended the classes, and occasional newspaper publicity. Recently detailed plans were agreed on by the Academy of Medicine of Cleve-

land and the Cleveland Child Health Association for the acceptance of patients in classes for private physicians. A copy of the agreement is given at the end of this article.

OUTLINE OF LECTURES

Eight lectures comprise each course. As soon as one series is completed, another is begun, so that patients may start on any lecture and continue until they have all eight lectures. Patients may repeat lectures if they so desire, and a number of mothers avail themselves of this opportunity. An attractive mimeographed outline accompanies each talk, topics of which are:

1. Responsibilities of Motherhood and Importance of Medical Examination:
   Poster demonstration of growth and development of the baby.
2. Personal Hygiene and Proper Dressing:
   Demonstration of corsets and binders.
   Demonstration of correct positions for sitting and resting in bed to bring about the greatest comfort.
   Discussion of sleep, exercise, elimination, weight, teeth and clothing.
3. Diet of Expectant Mother:
   Poster demonstration of foods and menus.
   Graphic demonstration showing needed quantities of essential minerals.
4. The Layette:
   Demonstration of complete baby outfit.
   Advice on what is essential together with information on where the items may be purchased and current prices of each.
5. Preparations for Delivery:
   Discussion of last ten days of pregnancy and first six weeks after the baby is born.
   Demonstration of preparation of bed for home delivery given in clinic classes.
6. Habit Formation:
   Sleeping, eating, bathing, and elimination habits for baby discussed.
   Demonstration of care of diaper and use of chamber and training panties.
7. Emotions:
   Fears, anger, jealousy, imagination, play and playthings.
8. Hygiene of Nursing Mother and Care of the Baby:
   Demonstration of breast and abdominal supports.
   Demonstration of use of baby's tray.
   Demonstration of how to nurse the baby.
   Demonstrations of baby's bath are given to mothers before they leave the hospital. Only when requested are they given in the classes.

TEACHING TECHNICS

Approach to the mother in the classes for private physicians is somewhat different from that for clinic patients because, as a rule, the former have a better educational background. In clinics the class usually lasts half an hour, but it may be extended if the physician is not ready for the patients at the end of that time. Lecture topics change every two weeks.

As the expectant mothers who attend classes for patients of private physicians meet specifically for the lecture period, it is possible to add more to these classes. Here the lecture period is fifty minutes, followed by a ten-minute discussion. The topics change weekly. These patients are given postcards to be mailed to the United States Children's Bureau, requesting the following pamphlets on antepartum and child care for further study:

"Prenatal Care"
"Infant Care"
"The Child From One to Six"
"Child Care"
"Child Management"
"Are You Training Your Child To Be Happy?"

MOTHERCRAFT CLASSES

In addition to the lectures, mothercraft classes are held in which the women are taught to make practical layettes. Materials are purchased in large lots at wholesale prices, and the garments are cut out prior to the classes. These are sold to the mothers at cost. Instruction includes all sewing stitches, simple crocheting and embroidering. Articles that are being made in the classes include nightgowns, kimonos, pantie style diapers, nainsook dresses, nainsook slips, gertrudes, saques, bonnets, booties, blankets, towels and wash cloths, baby buntings, carriage robes, lap protectors and bath aprons. Many of the prospective mothers secure the entire layette in this way.

PERSONAL CONFERENCES

When a mother appears to have some special problem, the instructors arrange a time for a personal conference. Often the question is one that may be covered in a subsequent lecture. Sometimes fears or superstitions have been implanted in the woman's mind. Many do not understand the value of the doctor's examination. Sometimes the mother is troubled about something and is afraid or too timid to consult her doctor. In the latter cases the instructor tries to put the woman in the frame of mind to consult her physician, and, when she deems it advisable, the nurse telephones the physician to let him know the circumstances revealed to her so that he is prepared to help the patient on her next visit. The great value of these conferences is that they ease the mind of the expectant mother, giving her a clearer picture of what has been vague.

VISITS TO PATIENTS

It is impossible for the instructors to visit all the women who attend the classes. As information regarding delivery and postpartum care of clinic patients can be obtained from the clinic records, only such cases presenting special difficulties are visited. However, an attempt is made to visit the greater number of the patients of private physicians who are delivered in the hospitals. These visits usually are made on the days in which the instructor is at the hospital for a clinic class. In the case of some complication, such as a mental condition or an abnormal baby, a home visit may be made.

CALLS ON PHYSICIANS

When a physician is informed that his patients are attending the lectures, or when he first contemplates referring his patients to the classes, he often requests an interview with the instructor to learn exactly what instruction is given. The instructor then visits the physician on appointment in his office to explain the work. This usually clears up any misunderstanding and secures his hearty cooperation.

STUDENT INSTRUCTION

Students in the University Public Health Nursing District Teaching Center attend at least one lecture for observation. This provision applies to students in all Cleveland hospitals affiliating with the teaching district, who are taking two months' public health work in the district.

As an introduction to the antepartum project, postgraduate nurses from the School of Applied Social Sciences of Western Reserve University are given two group lectures by the antepartum instructors. With the help of the instructor in preparing lecture outlines, each student then teaches two of the clinic classes, a report of which is made to the teaching district.

TALKS TO SPECIAL GROUPS

On request, the antepartum instructors give lectures to outside groups, such as parent-teacher associations and church societies. Talks have been given to the clerks in the infant departments of the larger stores in order to give them a better understanding of what garments to suggest to the customer who is trying to select a suitable layette.

RECORDS

The patient of a private physician must present an admission card signed by her physician before she is registered in the class. These cards, which contain space for the patient's name and address, the physician's signature and the date issued, are furnished to physicians by the Academy of Medicine.

When an expectant mother enrolls in the class she is registered in an attendance book, with the following information:

1. Registration number.
2. Name of mother.
3. Address.
4. Color.
5. Parity.
6. Age.
7. Month delivery is expected.
8. Name of physician (unless a clinic case).
9. Columns in which to list dates of attendance.

After the mother has been confined, the following information is added to the records:

1. Date of delivery.
2. Home or hospital delivery.
3. Any complications in delivery or deformities of the new-born infant.
4. Deaths of mothers or infants, with causes.

This information is secured from clinic or hospital records in the case of clinic patients. Patients of private physicians are furnished follow-up cards containing space for this information, in return envelops, to be mailed to the Child Health Association office after delivery. This may be supplemented by hospital, physician, or Division of Health records when necessary. In this way a complete record is kept of each mother.

On receipt of the card from the mother announcing the arrival of the baby, a congratulatory card signed by the instructor is mailed to the mother from the office of the Child Health Association.

PERSONNEL

Qualifications necessary for the successful instruction of expectant mothers are many. A thorough training in public health nursing, with special emphasis on the hygiene of maternity and infancy, is the foundation. The instructor must acquire a knowledge of social hygiene, child psychology and nutrition, as these play important rôles in maternal care. She should be versed in teaching methods, in public speaking, and in group and individual psychology. If mothercraft classes are included in the program, she must have a teaching knowledge of sewing.

She should know the regulations of the health department and the local hospitals and the preferences of the local obstetricians. She must keep abreast of new developments in her line. She should keep informed of what maternity and infant garments and equipment are on the market in order to advise mothers in making suitable selections. Above all, she must possess a personality that will secure the confidence of both the expectant mother and her physician.

COST OF PROGRAM

In considering the establishment of an antepartum group instruction program, finances must be considered. Necessary funds for the salaries of capable instructors must be provided. There is the initial cost of setting up the demonstrations for the lectures. In Cleveland the space, heat and janitor services for the classes are furnished by the organizations operating the buildings in which the classes are held. To carry the demonstrations satisfactorily and to get quickly from one class to another, it is advisable that the instructor drive a car, which means transportation expenses. Current expenses for stationery and other supplies also should be included. A part of this expense may be met by charging a nominal admission fee of patients of private physicians and by selling at cost the outlines and materials used in the classes.

SERVICE FIGURES

During 1934, lecture classes in Cleveland for clinic patients were held in four locations and for patients of private physicians in four locations; 646 classes were held; 2,305 individuals registered in the classes, with a total attendance of 12,785. The maternal mortality rate of women attending these classes in 1934 was 1.4 per thousand live births, compared with the city rate of 5.2. If deaths from abortions are eliminated, the city rate for 1934 was approximately 4 per thousand live births.

AGREEMENT BETWEEN CLEVELAND CHILD HEALTH ASSOCIATION AND ACADEMY OF MEDICINE

Following is a copy of the plan agreed on for the conduct of the lectures presented by the Cleveland Child Health Association and the Academy of Medicine of Cleveland:

1. The Academy of Medicine of Cleveland recognizes the value of the lectures on prenatal care and feels that they meet a definite need and that they should be continued.

2. The joint sponsorship of the lectures for patients of private physicians by the Cleveland Child Health Association and the Academy of Medicine of Cleveland is entirely satisfactory and there is no criticism of the lectures as conducted or of any individual associated with their presentation.

3. In order to assist in meeting the expenses of presenting these lectures, each applicant shall be charged the sum of one dollar for the course of eight lectures. The fee shall be elastic and may be waived in case the patient shall be unable to pay. The inability to pay the fee shall be decided by the physician referring the case or by the nurse in charge of the lecture, after investigation.

4. The fee shall be collected from the patient by the nurse in charge of the lecture and an account shall be rendered to the Academy of Medicine of all such money collected. All funds collected shall be applied by the Cleveland Child Health Association to meeting expenses incident to the presentation of the lectures.

5. No patient shall be accepted at the lectures without the consent of her physician.

6. No patient shall be admitted to the lectures except upon the presentation of an admission card supplied to her physician by the Academy of Medicine of Cleveland, which admission card is herein described.

7. In the case of a patient applying for admission to the lectures without first obtaining the reference of her physician, she shall be informed at once by the nurse in charge of the proper procedure for admission, but she may be permitted to attend that lecture at which she has first presented herself.

8. In case of such patients who present themselves without the reference of their physician the nurse in charge shall, in every case, obtain from the patient the name and address of her physician and such patient shall be informed that the Academy of Medicine of Cleveland will communicate with her physician, explain to him the nature of the instruction given in the lectures, and, if he desires, furnish him with a proper admission card for his signature. This card may be sent to the office of the Academy of Medicine or it may be given to the patient to present at the next lecture.

9. In case the physician does not desire the admission of his patient to the lectures she may not be admitted and she shall be so informed by letter from the Academy of Medicine before the time of the next lecture.

10. The office of the Academy of Medicine of Cleveland shall communicate immediately with any physician whose patient presents herself at the lectures without his reference and shall explain to him the nature of instruction given in the lectures and shall tell such physician that his patient may be admitted only with his consent and if he then shall desire his patient to attend the lectures he shall be furnished with an admission card by which he may refer his patient to the lectures.

11. In case a patient attending the lectures without reference by a physician shall claim to have no physician and to know of none to whom she might go, such patient shall be referred by the nurse in charge to the office of the Academy of Medicine of Cleveland, which office shall, upon her application, furnish her with the names of three physicians of the type and in the location to fit her needs. No nurse shall at any time recommend a physician or refer a patient to one.

12. All the above provisions shall apply equally to physicians whether members or nonmembers of the Academy of Medicine of Cleveland.

13. There shall be designed and furnished to physicians who desire to refer patients to the lectures an admission card, which shall state that the lectures are conducted jointly by the Cleve-

land Child Health Association and the Academy of Medicine of Cleveland, and shall contain a space for the patient's name and address and the physician's signature and the date issued. Such cards may be furnished only by the office of the Academy of Medicine of Cleveland to physicians.

14. There shall be no change in the procedure or method of supervision or in the conduct of the lectures except by joint approval of the Cleveland Child Health Association and the Academy of Medicine of Cleveland.

15. Nothing herein set forth shall apply to such lectures as are now conducted at certain of the hospitals of Cleveland.

1900 Euclid Avenue.

Medicolegal

Compensation of Physicians: Compensation for Medical Services Contingent on Recovery of Damages; Validity of Contract.—Sophie Magid was injured through the negligence of a third person. The physician-plaintiff agreed to treat her and to accept as his compensation 20 per cent of any amount she might recover from the person responsible for her injuries. If she received nothing the physician was to obtain nothing. The patient thereafter started suit against the person responsible for her injuries but was reluctant to proceed. On the physician's insistence she proceeded to trial. At the trial the physician testified and procured another medical expert to testify, and the patient obtained a verdict for $7,200. On the failure of the patient to pay the physician, he instituted this present action to recover 20 per cent of the $7,200 verdict obtained by the patient. From a judgment for the patient, the physician appealed to the Supreme Judicial Court of Massachusetts.

The contract, said the Supreme Judicial Court, entered into between the physician and the patient, and the inference necessarily drawn therefrom, namely, that the physician would testify in behalf of the patient at a future trial, presents a case which has every element of an unlawful agreement. It contemplates legal proceedings, it provides for a sharing in the fruits of litigation, it is an agreement in which the physician had no previous interest in the subject matter of the litigation, and it provides that the fruit of the litigation contracted for shall be the only compensation the physician is to receive. Without invoking the rule governing such unlawful agreements, continued the Supreme Judicial Court, it has been directly held that a contract by one injured, to pay a percentage of the amount received from the one responsible for the injury to his physician for services in treating the injury, is against public policy and void where the parties contemplated that the physician shall be a witness for his patient in case suit is necessary. The court accordingly affirmed the judgment of the trial court in favor of the patient.—*Weinberg v. Magid (Mass.), 189 N. E. 110.*

Accident Insurance: Trauma Inducing Spread of Quiescent Streptococcic Infection.—The defendant insurance company promised to pay certain benefits on the death of Lewis from "bodily injuries effected directly and independently of all other causes by accidental means . . . and due solely to external, violent and involuntary causes" resulting in continuous total disability from the date of the accident, but not for "death due to disease, whether accidental or otherwise." Lewis, in diving, June 15, struck his head on the bottom of a lake and fractured an infected tooth, causing a generalized spread of the infection. Although complaining of dull head pains and extreme lassitude, and although having a temperature sometimes as high as 104, he continued at work until August 23, when he was taken to a hospital, where he died on August 29. His wife brought suit in the district court of the United States for the western district of Pennsylvania against the insurance company and recovered judgment. The insurance company appealed to the circuit court of appeals, third circuit, which at first affirmed the judgment of the district court but, on reargument, reversed the judgment and ordered a new trial.

The insurance company contended that Lewis's death was not caused directly and independently of all other causes by accidental means, but by the dissemination of streptococci which were lodged in the roots of an abscessed tooth. To sustain its contention the insurance company cited a number of cases, which, in substance, held that no recovery may be had under a policy similar to the policy here in question if the death of the insured results from an aggravation of a preexisting disease and if the accident, alone, would not have caused the death. But, answered the circuit court of appeals, in all the cases cited the insured was not in normal health but was suffering from some well recognized, present, persisting disease at the time of the accident, which aggravated the effects of the accident or which itself was aggravated by the accident, and which disease was a factor in causing the death. In this case, however, Lewis was in good health, not only doing his work daily without difficulty but taking part in sports and athletics. There were streptococci at the root of a tooth but they were apparently walled in and were not doing any perceptible harm. There are perhaps always germs of one kind or another in our bodies, confined, quiescent and impotent, which may always remain so. The presence of these germs in an apparently normal and healthy body is not a "disease" within the meaning of the policy. The policy does not provide that the body must be free from every germ and defect, but it simply provides that it "does not cover death due to disease," such as those mentioned in the cases cited by the insurance company.

The circuit court of appeals agreed with the district court that Lewis died as a result of bodily injuries effected directly and independently of all other causes by accidental means within the meaning of the policy but reversed the judgment against the company, and ordered a new trial, because the record did not show, in the opinion of the court, that Lewis had suffered a continuous total disability from the date of the accident.—*Massachusetts Protective Ass'n v. Lewis, 72 F. (2d) 952.*

Malpractice: Sponge Left in Abdomen.—The physician-defendant performed a cesarean operation on the plaintiff. The incision did not heal properly; it ulcerated and discharged pus. About four months later another physician discovered a sponge in her abdomen. Thereafter the plaintiff sued the defendant and the case was tried by the court without a jury. The physician-defendant testified that the sponge found was of the type used for sponging "before entering an incision" and which should never be allowed to get loose in the body. He was unable to account for its presence in the patient's abdomen save that "its presence was the result of some accident about which witness can only advance a theory." The court rendered a judgment in favor of the physician and the patient appealed to the Supreme Court of Florida, division A.

It is negligence per se, said the Supreme Court, for a physician to leave a sponge in a patient's body in the course of the performance of an operation. In such a case the burden of showing due care is on the physician. He cannot relieve himself from liability unless the sponge was so concealed that reasonable care on his part would not have disclosed it, and the patient's condition was such that, in his judgment, a special exploration for the sponge would have endangered the safety of the patient. Where a patient's condition is critical and the paramount requirement is to complete the operation in the shortest possible time, a failure to remove a sponge may or may not constitute actionable negligence, depending on the circumstances of the case, the burden being on the physician to show to the satisfaction of the jury that the particular act was not blameworthy because of the supervening necessity to complete the operation without delay. In the present case, the court continued, the defendant contended that a physician should not be deemed negligent when he has exercised every precaution, under the exigencies of the case, to remove from the body of the patient all sponges, packs and other objects used in the operation, by removing all such objects discoverable by the sense of sight and touch and by keeping mental note of all such objects as were placed in the patient's body, and removing all of them to the best of his recollection at the time the incision is closed. But, answered the Supreme Court, the evidence does not support this contention. The

defendant himself testified that he had to conclude the operation hurriedly for fear that the patient would die on the operating table before he could get the incision sewed up. But at the same time he admitted that the particular sponge, later found in the patient's body, was not an article that he had placed, or was required by any standard medical usage or practice to have placed, in the patient's abdominal cavity. On the contrary, he admitted in effect that the sponge was of a type used for sponging before entering an incision and had been allowed to get into the abdominal cavity as the "result of some accident about which witness can only advance a theory."

Even if it had been shown, said the court, that the defendant was required by the urgent necessities of the case to leave a sponge in the patient's abdomen, it was his legal duty so to inform his patient within a reasonable time thereafter so that she might seek as early relief as possible. The removal of all sponges used is part of a surgical operation and when a physician fails to remove a sponge he has used in the course of the operation he leaves his operation uncompleted and creates a new condition which imposes on him the legal duty of informing his patient and endeavoring with the means he has at hand to minimize and avoid untoward results likely to ensue therefrom.

The Supreme Court concluded that the trial court misapprehended the probative weight and legal effect of the evidence offered, reversed the judgment in favor of the physician, and ordered a new trial.—*Smith v. Zeagler (Fla.), 157 So. 328.*

Trauma as Cause of Cancer.—The plaintiff was injured, July 1, when an automobile driven by her husband collided with one of the defendant's wagons. Among other injuries sustained, one of her breasts was bruised and the overlying skin broken. Within seven weeks thereafter a mass developed at the site of the bruise, which was removed surgically, October 23. A pathologist found it to be "early carcinoma or cancer." The plaintiff sued the defendant, alleging that the cancer was caused by the accident. From a judgment for the plaintiff the defendant appealed to the Supreme Court of Wisconsin. While the appeal was pending the plaintiff died and the action was revived in the name of her administrator.

The defendant contended that the evidence was insufficient to show that the cancer was a result of the injuries sustained in the collision; that it is impossible in a particular case to say with a reasonable degree of certainty that cancer results from a specific injury. In the present case there was sufficient evidence, in the opinion of the court, to establish (*a*) the fact of injury or trauma; (*b*) that the injury was sufficiently severe to cause a bruising of the breast; (*c*) that prior to the injury there was no observable indication of the presence of a tumor; (*d*) that the tumor or cancer in question developed at the point where the injury was sustained; (*e*) that the presence of the tumor or cancer was observable within seven weeks from the time of the accident, and (*f*) that clinical diagnosis and roentgenologic evidence showed that the tumor was malignant. On the question of whether or not, in the face of these essential facts, it can be said with a reasonable degree of certainty that the cancer was caused by the injury sustained, the experts disagreed.

An expert witness, on behalf of the defendant, testified that the cancer did not result from the injury. The pathologist testified that his examination showed early carcinoma or cancer and that the breast also showed the results of chronic mastitis, some cysts and a hard area. He testified that the chronic condition had existed for several months, possibly longer, and that it might have been there for a year; that the cysts might have been there a number of weeks or several months or more. He expressed no opinion as to the cause of the cancer. An expert witness, on behalf of the plaintiff, testified that the injury *might* have caused the cancer, but that physicians "are unable to look at or to examine in any known way any particular malignant growth and say that this did or it did not arise as a result of injury." Another witness stated that "Considering all the facts in hand, and the fact that so far as can be humanly told there was no tumor in her breast prior to the injury, and considering the fact that an acceptable period had elapsed for such a cancer to develop to the size of a walnut, as given, and granting the fact that she had an adequate bruise, to the breast, it is my opinion that it is very probable that this cancer developed as a result of her injury." The testimony of this witness constituted the only evidence in the case, said the court, which tends to remove the question in dispute from the realm of doubt and speculation. The witness, however, assumed that there was an "adequate" bruise. Neither he nor any one else testified as to what an "adequate" bruise is or whether the bruise which the woman received was "adequate." He further assumed that there was no tumor in her breast prior to the injury, an assumption not warranted by the evidence. The evidence, said the Supreme Court, when analyzed, establishes no more than a possibility that the cancer resulted from the injury. Therefore the finding of the jury that the injury to the breast did cause the cancer was not sustained by the evidence.

During the trial a medical expert called by the defendant testified that he knew of no authority which stated that a sudden trauma may be followed by the development of a malignant growth. In cross-examining the witness, the plaintiff's counsel read an excerpt from a book on surgical pathology, with which the witness was familiar, to show that a reputable authority had made such a statement. Under the circumstances, said the court, the extract was admissible for the purpose for which it was offered.

In reversing the judgment of the circuit court, the Supreme Court remanded the case for a new trial, expressing the opinion that the facts in the case had not been fully developed.—*Bruins v. Brandon Canning Co. (Wis.), 257 N. W. 35.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Otolaryngology, Cincinnati, Sept. 14-20. Dr. William P. Wherry, 107 South 17th Street, Omaha, Executive Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Sky Top, Pa., Sept. 16-18. Dr. James R. Bloss, 418 Eleventh Street, Huntington, W. Va., Acting Secretary.

American Clinical and Climatological Association, Princeton, N. J., Oct. 21-23. Dr. Francis M. Rackemann, 263 Beacon Street, Boston, Secretary.

American Congress of Physical Therapy, Kansas City, Mo., Sept. 9-12. Dr. Nathan H. Polmer, 921 Canal Street, New Orleans, Secretary.

American Hospital Association, St. Louis, Sept. 30-Oct. 4. Dr. Bert W. Caldwell, 18 East Division Street, Chicago, Executive Secretary.

American Public Health Association, Milwaukee, Oct. 7-10. Dr. Reginald M. Atwater, 50 West 50th Street, New York, Executive Secretary.

American Roentgen Ray Society, Atlantic City, N. J., Sept. 24-27. Dr. E. P. Pendergrass, 3400 Spruce Street, Philadelphia, Secretary.

Association of American Medical Colleges, Toronto, Canada, Oct. 28-30. Dr. Fred C. Zapffe, 5 South Wabash Avenue, Chicago, Secretary.

Association of Military Surgeons of the United States, New York, Oct. 3-5. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Colorado State Medical Society, Estes Park, September 5-7. Mr. Harvey T. Sethman, 537 Republic Building, Denver, Executive Secretary.

Delaware, Medical Society of, Wilmington, Oct. 8-9. Dr. William H. Speer, 917 Washington Street, Wilmington, Secretary.

Indiana State Medical Association, Gary, Oct. 8-10. Mr. T. A. Hendricks, 23 East Ohio Street, Indianapolis, Executive Secretary.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 7-10. Dr. Ralph R. Coffey, 1103 Grand Avenue, Kansas City, Mo., Secretary.

Kentucky State Medical Association, Louisville, Sept. 30-Oct.3. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Michigan State Medical Society, Sault Ste. Marie, Sept. 23-25. Dr. Burton R. Corbus, 313 Metz Building, Grand Rapids, Acting Secretary.

Mississippi Valley Conference on Tuberculosis, Madison, Wis., Sept. 12-14. Mr. A. W. Jones, 613 Locust Street, St. Louis, Secretary.

Nevada State Medical Association, Elko, Oct. 25-26. Dr. Horace J. Brown, 120 North Virginia Street, Reno, Secretary.

Ohio State Medical Association, Cincinnati, Oct. 2-4. Mr. C. S. Nelson, Hartman Theatre Building, Columbus, Executive Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. J. D. McCarthy, 107 South 17th Street, Omaha, Secretary.

Oregon State Medical Society, Gearhart, Sept. 19-21. Dr. Blair Holcomb, Stevens Building, Portland, Secretary.

Pennsylvania, Medical Society of the State of, Harrisburg, Sept. 30-Oct. 3. Dr. Walter F. Donaldson, 500 Penn Avenue, Pittsburgh, Secretary.

Utah State Medical Association, Logan, September 5-7. Dr. George N. Curtis, Judge Building, Salt Lake City, Secretary.

Virginia, Medical Society of, Norfolk, Oct. 15-17. Miss A. V. Edwards, 1200 East Clay Street, Richmond, Secretary.

Wisconsin, State Medical Society of, Milwaukee, Sept. 17-20. Mr. J. G. Crownhart, 119 East Washington Avenue, Madison, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

5: 1-40 (July) 1935

Infections of the Hand. J. L. Branch, Montgomery.—p. 1.
*Treatment of Severe Preeclampsia and Eclampsia, with Especial Reference to Use of Ephedrine. W. B. McGee, New Orleans.—p. 4.
The Nervous Child. W. H. McCaslan, Union Springs.—p. 7.
Gallbladder Visualization. W. Wilkerson, Montgomery.—p. 13.

Treatment of Severe Preeclampsia.—McGee gives the symptoms of severe preeclampsia as generalized edema, elevation of the diastolic blood pressure to more than 110 mm., marked increase in weight, oliguria or anuria, more than a heavy trace of albumin in the urine with red blood cells and casts, epigastric pain, headache and dizziness, and eye symptoms or lassitude. He advises hospitalization, if possible, careful measure of intake and output of fluids, a dose of 1 ounce of magnesium sulphate, and restriction of fluids to 1,000 cc. a day if edema is present. Bidaily blood pressure and urine examinations should be made and the patient should be put on an eclamptic diet to be used not more than five days: fruit and fruit juices, water and fruit ices, berries and melons, baked Irish potatoes, asparagus, carrots and lettuce. If the blood pressure is below 140 systolic and 90 diastolic with oliguria, three-eighths grain (0.024 Gm.) of ephedrine sulphate may be given orally every four hours. In eclampsia, in the event that convulsions or coma ensue, the treatment is wholly empirical. The fall in blood pressure, and corresponding decrease in urinary output caused by barbital preparations, is counteracted by the administration of three-fourths grain (0.048 Gm.) of ephedrine sulphate, hypodermically, every four hours. The hypertension seen in eclampsia is undoubtedly a compensatory factor of the body in its attempt to excrete urine, chlorides and toxins through the already damaged kidneys. The ephedrine usually causes an elevation of blood pressure (Chen); this is followed by a relaxation of the spasms in the capillaries and an increased blood supply to the kidneys and brain. Any drug that tends to lower the blood pressure is contraindicated. If the convulsions persist after the intravenous injection of sodium amytal, one-fourth grain (0.016 Gm.) of morphine is indicated, followed by 3 grains (0.2 Gm.) of sodium amytal intramuscularly or 10 cc. of 25 per cent solution of magnesium sulphate, intramuscularly, repeated every three to six hours, if necessary. If there is an initial low blood pressure, three-eighths grain of ephedrine should be given every four hours. Spinal puncture may help to relieve the intracranial pressure if there is an increase in spinal fluid; unfortunately, the edema is usually incorporated in the brain tissues.

American Journal of Ophthalmology, St. Louis

18: 605-698 (July) 1935

Bilateral Temporal Pterygia. P. H. Reed and L. L. Mayer, Chicago.—p. 605.
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Various Bacillus Typhosus Antigens Used for Macroscopic Widal. M. R. Moore, Norwich, Conn.—p. 848.
Analysis of Public Health Expenditures by Geographic Subdivisions. W. F. Walker, New York.—p. 851.

Culture Mediums for Routine Diphtheria Cultures.—According to Laybourn, changes in reaction occur during the storage of blood serum preserved with chloroform, which influences the reaction of coagulated serum mediums in which such serum is used. The color and consistency of serum-bouillon mediums are indicative of the reaction. The addition of sodium hydroxide solution to serum-bouillon mixtures causes a hydrolysis which, if extensive, makes the consistency of the coagulum unsatisfactory for use. Human and hog serums require the use of less

alkali in the adjustment of the reaction than beef, sheep and horse serums, and they are preferable for this reason. Beef, sheep and horse serums form a softer coagulum than human and hog serums, which also makes them less satisfactory for use in throat culture mediums. The reaction of bouillon-serum mixtures changes during coagulation and sterilization, and allowance must be made for drift of reaction in adjusting the uncoagulated mixture. Staphylococcus aureus produces sufficient acid from the dextrose in Loeffler's medium in eighteen hours to influence greatly the luxuriance of growth, morphology and staining of Corynebacterium diphtheriae. A formula for diphtheria culture medium is suggested, which supports luxuriant growth of Corynebacterium diphtheriae with typical forms of the organism in the presence of Staphylococcus aureus.

American Journal of Surgery, New York

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Vicious Jejunocolostomy with Chronic Ileac Obstruction: Importance of Intestinal Localization. F. Christopher, Evanston, Ill.—p. 124.
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Epithelioma Following Chronic Paronychia. I. Silverman, Brooklyn. —p. 141.
Compound Fracture Complicated by Prolonged Streptococcus and Staphylococcus Septicemia, with Recovery. D. C. Moore, A. B. Blinn, East Orange, N. J., and W. J. MacNeal, New York.—p. 143.

Extraperitoneal Approach to Lumbar Sympathetic Nerves.—In performing a lumbar sympathectomy, Flothow makes an incision almost transversely at the level of the umbilicus, extending from the edge of the rectus muscle to the flank. The skin and subcutaneous tissues down to the fascia of the oblique muscle are dissected widely to expose a large portion of the external oblique fibers. An incision is made in the fascia of the external oblique muscle parallel with its fibers, well laterally, almost to the costal margin down to the fascia of the rectus muscle. The fibers of the muscle are separated and retracted widely, exposing the internal oblique muscle. The internal oblique is separated in the direction of its fibers from above the crest of the ilium again to the rectus muscle and retracted widely. The transversalis muscle is separated in the direction of its fibers as far as the exposure will permit. The transversalis fascia is opened and an extraperitoneal dissection of the retroperitoneal tissues is made. The retroperitoneal tissue, the peritoneum and its contents are pushed mediad until the psoas muscle is reached. The abdominal contents are retracted mediad, the fascia covering the psoas muscle is opened throughout the length of the exposure, and the aorta or the vena cava is retracted mediad. The sympathetic ganglions will be found lying under either the aorta or the vena cava on the bodies of the lumbar vertebrae at the medial edge of the insertion of the psoas muscle to the vertebrae. The entire chain from the first to the fourth lumbar ganglions inclusive is exposed. After the operation is finished, it is only necessary to take a few sutures in the transversalis muscle, a running suture in the internal oblique muscle and a running suture in the fascia of the external oblique. The operation was done in as little time as twenty-five minutes. The operation is without shock to the patient. It offers a rapid entrance and an adequate exposure.

Abscess of the Thyroid.—Henderson states that thyroid abscess occurred only four times in 545 consecutive thyroid cases. The most common symptoms are deep unilateral pain in the thyroid region, painful swallowing, hoarseness and malaise. There is sometimes tumefaction of the gland, with tenderness and reddening of the overlying skin. The chin is often depressed on the sternum during swallowing. The temperature curve is septic in type with a tachycardia disproportionate to the pyrexia. A differential diagnosis must be made from acute infections of the upper respiratory tract, cervical lymphadenitis, hemorrhage into an adenoma, malignant conditions, Riedel's struma and, very rarely, thyroglossal or branchial cysts and cystic hygromas. The complications are those attendant on spread of the infectious process into the surrounding tissues. The treatment comprises prevention of suppuration if possible. When it does occur, early, adequate and prolonged drainage is indicated. Prognosis is guarded. It is poorer in the suppurative than in the nonsuppurative variety. Four cases are reported in patients aged from 2 to 46, three of whom were males. The etiologic agents were Bacillus influenzae, a nonhemolytic streptococcus and a hemolytic streptococcus. In the fourth case cultures did not yield any organism and it is possible that this was due to the tubercle bacillus or less likely to one of the higher micro-organisms. There was recurrence, probably due to insufficient drainage, in two cases. The author concludes that tuberculosis and other granulomas of the thyroid may occur but are rare.

Bacteriophage in Treatment of Urinary Infections.—According to Wehrbein, only relatively superficial infections can be treated by bacteriophage application. Pyelitis and cystitis are ideal conditions for this type of therapy, but, if kidney abscesses have occurred or if the prostate or seminal vesicles are infected, cure cannot be expected by means of bacteriophage therapy. The bacteriophage must be quickly effective before it is used. It should lyse one billion micro-organisms per cubic centimeter in from three to five hours. Prolonged incubation should show no second growth. The bacteriophage should be placed in as large a quantity and in as concentrated a form as possible in the infected area. If the kidney pelvis is infected, the pelvis should be actually filled with the bacteriophage solution by the use of a large catheter. If only the bladder is infected, at least 50 cc. should be put into the empty bladder. All antiseptics must be avoided. If the first application of the bacteriophage is unsuccessful, it is useless to repeat. Of thirty-four cases treated by the author, ten were acute pyelitis cases. Of these, seven were cured through one application. The other three were improved but not cured. Of the twenty-four chronic and subacute cases of pyelitis, only five were cured; thirteen were benefited and six were failures. In addition to the thirty-four cases treated, the author successfully used bacteriophage in postoperative infections and in incised abscesses.

The Larval Treatment of Osteomyelitis.—Ferguson and McLaughlin widely incise the soft tissues and saucerize the bone to expose the involved area. The wound is packed with

gauze, which is not changed for at least three days except to renew the outside dressings. The muscle and skin wound is lined with petrolatum gauze to facilitate removal of the packing and to minimize the associated pain. On the fourth day the packing is removed. When the capillary ooze has ceased, the wound is irrigated with warm physiologic solution of sodium chloride and the maggots are introduced. Several methods of introducing maggots were used, all of which proved satisfactory. In small wounds it is frequently possible to transfer the maggots from the bottle to the wound with the handle of a sterile scalpel. When the larvae are embedded in food material, a small amount of physiologic solution of sodium chloride is poured into the bottle. The maggots usually float to the top of the fluid after gentle shaking. They may be caught on several layers of sterile gauze as the solution is poured from the bottle. The maggots are shaken from the gauze on the wound. In cases in which the compress form of dressing is used, the gauze containing the maggots is introduced directly into the wound. The chief complication observed is the marked skin excoriation produced by the wound secretion after introduction of the maggots. Pain and discomfort are complications frequently noted. These symptoms are due to the introduction of too many maggots into the wound. Removal of some of the maggots usually relieves most of the discomfort. Maggot therapy is especially effective in removing necrotic areolar tissue. Maggot action alone gives a more complete result than can be obtained by excision and without injury to recovering tissue. Maggot action is less rapid but distinctly helpful in attacking the necrotic fibrous tissue. Maggot therapy is useful not only in the treatment of osteomyelitis but in any other wound containing sloughing tissue that can be exposed by adequate incision. The authors report the successful treatment of thirteen cases of osteomyelitis, eight carbuncles, six sloughing ulcers of the leg, seven cases of gangrene and thirteen other lesions of soft tissues.

Archives of Internal Medicine, Chicago

56: 1-210 (July) 1935

*Biologic Effects of Thymus Extract (Hanson): Accruing Acceleration in Growth and Development in Five Successive Generations of Rats Under Continuous Treatment with Thymus Extract. L. G. Rowntree, J. H. Clark, Philadelphia, and A. M. Hanson, Faribault, Minn., with technical assistance of A. Steinberg, Philadelphia.—p. 1.

Cost of Work in Patients with Hypermetabolism Due to Leukemia and to Exophthalmic Goiter. Stella Paisley Briard, J. T. McClintock and C. W. Baldridge, Iowa City.—p. 30.

Treatment of Congestive Heart Failure and Angina Pectoris by Total Ablation of Normal Thyroid Gland: XVI. Sensitivity of Man to Epinephrine Injected Intravenously Before and After Total Thyroidectomy. J. E. F. Riseman, D. R. Gilligan and H. L. Blumgart, Boston.—p. 38.

*Circulatory Changes in Angina Pectoris: Experimental Study. P. Shambaugh, Boston.—p. 59.

Acute Cardiac Infarction Involving Anterior and Posterior Surfaces of Left Ventricle: Electrocardiographic Characteristics. C. C. Wolferth and F. C. Wood, with collaboration of S. Bellet, Philadelphia.—p. 77.

*Action of Oil of Peppermint on Secretion and Motility of Stomach in Man. J. Meyer, L. Scheman and H. Necheles, Chicago.—p. 88.

Acute Carbon Tetrachloride Poisoning: Report of Case. E. R. Lehnheer, Boston.—p. 98.

Diseases of Adrenal Glands: Review, with Especial Reference to Clinical Aspects. E. J. Kepler, Rochester, Minn.—p. 105.

Disease of Thyroid Gland: Interpretative Review of Progress Toward Solution of Problem. W. M. Boothby, Rochester, Minn.—p. 136.

Biologic Effects of Thymus Extract.—Rowntree and his associates found that the thymus extract prepared from the thymus glands of young calves by Hanson, when injected intraperitoneally, seemed to increase the weight and growth of prepubertal male and of mated mature female rats but exerted no noticeable effect on the new-born animals. Treatment of parent rats seems to increase slightly the number and size of the litters and the weight of the young at birth. The most striking biologic effects are observed in the offspring of successive generations of rats continuously treated by intraperitoneal injection and consist of accruing acceleration in growth and development: early eruption of teeth, appearance of fur, opening of the eyes, descent of the testes and opening of the vagina. While precocity was lacking in the early litters born of thymus-treated parents in the first generation, it appeared in later litters. This precocity is apparently not effected through the mother's milk. Young rats from thymus-treated strains occasionally matured and bred early whether they received injections of thymus extract or not, as both thymus-treated and control rats in the F_1 generation cast litters at forty-two and forty-five days, respectively. It appears that thymus extract (Hanson) affects the fertility and rate of growth and development of white rats. The interruption of thymus administration for one generation nullified to a large extent the effects of the previous administration of thymus, even though the treatment may have extended through several generations of rats. Rats receiving thymus extract appear unusually docile, healthy and contented. Excessive amounts of thymus extract result in toxicity, as evidenced by increasing auriculoventricular dissociation and eventual heart block.

Circulatory Changes in Angina Pectoris.—Shambaugh employed essentially the procedure described by Sutton and Lueth in his investigations on the effect of experimental angina pectoris on the blood pressure, the effect of the elevation in the blood pressure on the production of experimental angina pectoris, and the effect of increasing the heart rate on the production of experimental angina pectoris. His observations on the effect of mechanical interference with the coronary blood flow in unanesthetized dogs are in accord with those of previous observers. There is a constant typical reaction that, without doubt, signifies pain. A graphic record of this reaction can be made only by noting changes in the respiratory tracing. The changes in the respiratory tracings are merely confirmatory and, in addition, serve to record the time relations of the response. When the respiration is altered with the pain reaction, and this is the rule, the author found that an acceleration is a more accurate indication than is an increase in amplitude. It was found unnecessary to carry the stimulus beyond the point at which a moderate degree of discomfort was produced. The experimental observations lend support to the clinical concept that the elevation of blood pressure frequently observed in angina pectoris is more likely the cause than the result of the attack. The tachycardia may also play a similar part, although this has not been demonstrated in the present experiments. The fact that these circulatory changes may precipitate attacks in certain cases of angina pectoris does not mean that they are the important factors in all cases of the disorder.

Action of Oil of Peppermint on Stomach.—Meyer and his co-workers discuss the action of oil of peppermint on the motility and secretion of the stomach of patients having peptic ulcer. They have made the observation on themselves that the chewing of peppermint candy or lozenges relieves pain caused by hunger and by distress after a heavy meal. Oil of peppermint when given by itself or with a secretory stimulant depresses the secretion of acid by the stomach. The chloride content has been determined on samples of gastric juice before and after the introduction of alcohol and of alcohol and oil of peppermint into the stomach. The level of the chlorides was not affected when the free and combined acidity decreased after alcohol and oil of peppermint were given. This may be indicative of a change in the mechanism of secretion; i. e., suppression of the free hydrochloric acid and possible increase of the sodium chloride. Menthol was found to have no acid-depressing effects. Experiments on dogs with gastric pouches indicate that the action of the oil is probably a local one on the mucosa of the pouch. The authors are treating a number of peptic ulcer patients with the essence of oil of peppermint. Relief of pain has definitely been noted in a few, but the period of observation is not sufficient to warrant a statement. In view of the popular use of peppermint for relief of gastric distress and the interest and importance of the mechanism of pain in ulcer, it might readily be argued by those who favor the theory of acid in relation to pain that the relief of symptoms following the use of oil of peppermint is due to a diminution in free acid. However, there is still considerable dispute as to the factors involved in pain in peptic ulcer. In a previous article one of the authors proved that relief of pain occurred independent of the degree of free acidity in patients with chronic peptic ulcer. It was suggested that the relief of symptoms in patients with peptic ulcer following the use of foreign protein was due to an improvement of the circulation in the vascular bed in and about the ulcerated area, and the hypothesis was advanced that the pain of ulcer is due to ischemia and asphyxia resulting from depletion of the vascular bed in and about the ulcerated area. It was on the basis of this conception of the mechanism of

pain in peptic ulcer that the effects of an essential oil were tried, a substance that might cause a local hyperemia. The sense of warmth and the feeling of ease following the ingestion of essence of oil of peppermint are well known.

Archives of Ophthalmology, Chicago

14: 1-182 (July) 1935

Exophthalmos from Surgical Diseases, Especially as to Involvement of Protective Retrobulbar Space. W. P. Eagleton, Newark, N. J.—p. 1.
Exophthalmos: Ocular Complications; Causes from Primary Lesions in Orbit; Surgical Treatment. A. B. Reese, New York.—p. 41.
Suprasellar Arachnoid Cyst. A. Barlow, Philadelphia.—p. 53.
Disposition of Fibers of Retinal Origin in Lateral Geniculate Body: Course and Termination of Fibers of Optic System in the Brain of the Cat. R. W. Barris, Chicago.—p. 61.
Neurinoma of Orbit. Olga Sitchevska, New York.—p. 71.
Measurement of Speed of Adjustment of Eye to Near and Far Vision. C. J. Robertson, Annapolis, Md.—p. 82.
Endophthalmitis Phaco-Anaphylactica: Clinical Study. E. L. Goodman, Washington, D. C.—p. 90.
Biochemistry of Lens: IV. Origin of Pigment in Lens. J. G. Bellows, Chicago.—p. 99.

Illinois Medical Journal, Chicago

68: 1-96 (July) 1935

Distribution of Encephalitis (St. Louis Type) in Illinois During 1932, 1933 and 1934. W. H. Tucker, Springfield.—p. 61.
Carcinoma and the General Practitioner. B. Markowitz, Bloomington.—p. 66.
Vitamin G Deficiency. P. L. Day, Little Rock, Ark.—p. 69.
Spontaneous Rupture of Uterus: Report of Case. E. S. King, Chicago.—p. 73.
*Continuous Gastric Siphonage. D. Kasler and H. P. Miller, Rock Island.—p. 77.
Tularemia. S. D. Rosenthal, Chicago.—p. 80.
Familial Hemorrhagic Condition of Unusual Type. J. B. Gillespie, Urbana.—p. 83.
Severe Whooping Cough Responding to Pertussis Vaccine (Sauer): Report of Case. F. Stenn, Chicago.—p. 86.
Pernicious Anemia Following Gastric Surgery. S. J. Lang, Evanston.—p. 86.
Rectal Carcinoma: Treatment and Prognosis. C. F. Dixon, Rochester, Minn.—p. 89.
The Schick Control. A. I. Love, Chicago.—p. 93.

Continuous Gastric Siphonage.—According to Kasler and Miller, continuous siphonage may be used with success in post-abdominal operations in which acute dilatation of the stomach, gastric retention and upper intestinal ileus are likely to occur or have occurred. The comfort of the patient is greatly helped by relief from vomiting and ability to drink water freely. The apparatus is simple and efficient but requires care in handling. It consists of three units: a receptacle, a suction chamber, which is composed of the barrel of a 20 cc. syringe fitted with a two-holed rubber stopper, and a basin. The rubber stopper is fitted with two glass connectors. One is straight and is connected by rubber tubing to the receptacle above. The other connector is curved and joins the nasal tube. The suction chamber empties into the basin by means of a suitable length of rubber tubing, the end of which is beneath the water in the basin. The receptacle is filled with water and allowed to drip at the rate of from 60 to 80 drops (4 to 5.3 cc.) per minute. The water runs out of the suction chamber through the tube from the chamber to the basin and creates a vacuum behind it, the force of which is exerted through the nasal tube. Soon after the suction is started, the stomach contents will appear and pass through to the basin. Continuous siphonage cannot be maintained by the simple use of a nasal catheter because the entrance of air and gas into the system interrupts the siphonage. By means of the apparatus the functional capacity of the stomach can be determined and the amount of fluid passing through the pylorus in either direction can be measured in cubic centimeters. The patient is encouraged to drink as much fluid as he likes and, as the gastro-intestinal tonus improves, increasing proportions of the oral intake will go through the pylorus instead of being removed by suction. Subtracting the oral intake from the difference between the amount in the basin and the amount placed in the receptacle above gives a certain quantity of fluid in cubic centimeters. This figure, known as the pyloric balance, tells what has happened to the fluid taken by mouth. When the amount recovered from the stomach is greater than the oral intake, the pyloric balance is negative; and when the amount taken by mouth is greater than the amount recovered from the stomach, the pyloric balance is positive. When continuous siphonage is interrupted by a plug of mucus in the nasal tube, the tube should be withdrawn about one inch and reinserted. If this is unsuccessful in reestablishing the suction, the nasal tube should be disconnected and some water injected to clear it. The nasal tube should be removed, cleansed, sterilized and inserted into the other nostril every twenty-four hours. The authors report four cases in which continuous siphonage was employed. In the first case the patient was relieved of ileus and hiccups by this method when other methods had failed. In the second and third cases, early manifestations of ileus were present and these were checked. In the fourth case, postoperative vomiting and retention were efficiently relieved, and the apparatus added materially to the patient's comfort.

Iowa State Medical Society Journal, Des Moines

25: 327-426 (July) 1935

The American Medical Association. W. L. Bierring, Des Moines.—p. 327.
Relationship of Arterial Hypotension to Surgical Risk. J. S. McQuiston, Cedar Rapids.—p. 331.
Aspiration Treatment of Empyema in Children. R. A. Strong, New Orleans.—p. 334.
Supracondylar Fractures of Humerus: New Method of Treatment. V. A. Ruth, Des Moines.—p. 337.
Hematopoietic Diseases and Nervous System. F. H. Lamb, Davenport.—p. 340.
*Some Clinical Manifestations of Chronic Encephalitis. C. G. Barer, Iowa City.—p. 342.
Rational Treatment of Diarrhea. B. A. Melgaard, Sioux City.—p. 345.
Intra-Orbital Meningioma (Endothelioma) of Optic Nerve Sheath. H. E. Thompson, Dubuque.—p. 347.

Manifestations of Chronic Encephalitis.—Barer discusses the more common types of chronic encephalitis that result after an epidemic of epidemic (lethargic) encephalitis. The parkinsonian syndrome is most common and presents itself in various degrees at various intervals after the acute infection. The patient first complains of slowness of movement, stiffness, pain in the back of his neck, loss of vitality, shakiness and weakness. Some flexion of the entire spine is usually present. In walking there is a loss of the normal coordinated movement of swinging the arms and some festination. The eyes are fixed straight forward and there is some impairment or loss of the capacity for ocular convergence. The face has a blank, fixed expression. The skin is often greasy and the mouth is held partly open. The voice is weak, with articulation and phonation impaired. The muscular rigidity that is present in the paralysis agitans syndrome of chronic encephalitis is known as the cog-wheel type of rigidity. With this rigidity the paralysis agitans tremor sometimes develops. It is not seen as often in chronic encephalitis as it is in senile or true paralysis agitans. In all cases the tremor is synchronous and is increased in amplitude by emotion or exertion. Other symptoms and signs are palilalia, micrographia, paradoxal kinesia, akathisia and disturbed liver function. The condition is progressive and after a variable length of time the patient becomes completely incapacitated. Oculogyric spasms of chronic encephalitis are pathognomonic of chronic encephalitis. With this condition the patient complains that his eyes suddenly roll upward and want to stay there. There is absence of pain, loss of vision and flashes of light or scotomas. There is sometimes an associated closing of the eyelids, turning of the head upward and to one side, and the desire to sleep. The eyes return to normal as suddenly as they go into the spasm. In the ophthalmoplegic type of chronic encephalitis there is sometimes inequality of the pupils with some impairment of the pupillary reflexes to light and in accommodation. There may be a ptosis of one or both eyelids, dimness or mistiness of vision or perhaps even definite muscle palsy. This type is frequently seen in conjunction with the paralysis agitans syndrome and the oculogyric spasm types of chronic encephalitis. In the narcoleptic type of chronic encephalitis there is an irresistible desire to sleep, which comes on at any time in the day, and the patient must go to sleep for a variable length of time. On awakening he is much refreshed. The second symptom, which sometimes occurs with the first, but never alone, is cataplexy. The author mentions the hemiplegic type, the myoclonic type, respiratory tics, tics of the facial and deglutatory muscles, the diabetes insipidus syndrome, the neuritic types, inversion of the sleep mechanism, convulsions, amyotrophic lateral sclerosis and myasthenia gravis. Chronic encephalitis is not the sequel of acute encephalitis, because the

clinical picture described does not appear immediately following the acute infection, the condition is progressive, and the histologic picture indicates an active change in the parenchyma, which is glial infiltration and perivascular infiltration. The parkinsonian syndrome of chronic encephalitis results from lesions in the substantia nigra. The symptoms being due chiefly to the death of nerve cells, attempts at specific therapy are hopeless, but palliative measures may be used.

Journal of Allergy, St. Louis

6: 415-516 (July) 1935

Inhalation of Epinephrine for Relief of Asthmatic Symptoms. J. B. Graeser and A. H. Rowe, Oakland, Calif.—p. 415.
Food Idiosyncrasy as Factor in Digestive Leukocyte Response. W. T. Vaughan, Richmond, Va.—p. 421.
Oral Desensitization to Common Foods. Beatrice M. Keston, Irene Waters and J. G. Hopkins, New York.—p. 431.
Studies of Specificity in Multiple Hypersensitiveness by Quantitative Titration and Absorption of Reagins. J. Harkavy and E. Witebsky, New York.—p. 437.
Practical Procedures in Investigation of Certain Allergic Dermatoses. M. B. Sulzberger and A. Rostenberg Jr., New York.—p. 448.
*Patch Test for Gold Hypersensitivity. M. R. Lichtenstein, Chicago.—p. 460.
Use of House Dust Oil and Thrasher Dust Oil in Contact Dermatitis. C. M. Stroud, St. Louis.—p. 464.
Psychogenic Urticaria: Case Study. W. C. Menninger, Topeka, Kan., and J. E. Kemp, Chicago.—p. 467.
Dermatitis from Proprietary Hair Tonic: Search for Offending Ingredient by Patch Tests. H. Goodman, New York.—p. 474.
Drinking Water as Cause of Eczema. L. O. Dutton, El Paso, Texas.—p. 477.
Studies in Atmospheric Pollen of San Francisco. W. C. Deamer, San Francisco, and H. E. McMinn, Oakland, Calif., with technical assistance of Bernadette Tilden and Elsa Brumlop.—p. 480.
Botanical Survey of Northwestern California. A. H. Rowe, Oakland, Calif., and J. W. Howe, Arcata, Calif.—p. 494.
Death from Ten Grains of Aspirin. N. Francis, O. T. Ghent and S. S. Bullen, Rochester, N. Y.—p. 504.

Patch Test for Gold Hypersensitivity.—Lichtenstein observed that exfoliative dermatitis, rashes, gastro-intestinal symptoms and neuritis in patients treated with gold compounds are due to the development of hypersensitivity. The patch test with 33 per cent gold sodium thiosulphate in hydrous wool fat is positive in about 50 per cent of those treated, including all those presenting the complications mentioned, and persists over a long period of time. The patch test, if performed frequently, will usually be found positive before complications occur. Patients treated with gold succinimide become sensitive to the patch test but rarely show any complications. Kidney injury cannot be correlated with hypersensitivity but appears to be a direct toxic effect of the gold compounds.

Journal of Biological Chemistry, Baltimore

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Galacturonic Acid as Precursor of Ascorbic Acid. Ruth Johnstin and Kathryn Sue Potter, Wellesley, Mass.—p. 279.
Unrecognized Forms of Sulphur in Proteins. Doris Blumenthal and H. T. Clarke, New York.—p. 343.
Determination of Thyroxine in Thyroid Substance. N. F. Blau, with technical assistance of A. C. Kibrick, New York.—p. 351.
Photochemical Phenomena Involved in Vitamin G (B_2) Studies. G. C. Supplee, S. Ansbacher and R. C. Bender, Bainbridge, N. Y.—p. 365.
Composition of Cartilage, Bone, Dentin and Enamel. M. A. Logan, Boston.—p. 375.
Chemo-Immunologic Studies on Soluble Specific Substance of Pneumococcus: II. Chemical Basis for Immunologic Relationship Between Capsular Polysaccharides of Types III and VIII Pnemococcus. W. F. Goebel, New York.—p. 391.
Cystinuria: IV. Metabolism of Homocysteine and Homocystine. E. Brand, G. F. Cahill and R. J. Block, New York.—p. 399.
Lactose in Plasma of Pregnant and Lactating Women. R. S. Hubbard and H. J. Brock, Buffalo.—p. 411.
Availability of Calcium from Some Typical Foods. M. L. Fincke and H. C. Sherman, New York.—p. 421.
Digitalis Sapogenins. W. A. Jacobs and J. C. E. Simpson, New York.—p. 429.
Metabolism of Naphthalene in Adult and Growing Dogs. J. A. Stekol, New York.—p. 463.
Micromethods for Determination of Ammonia, Urea, Total Nitrogen, Uric Acid, Creatinine (and Creatine) and Allantoin. H. Borsook, Pasadena, Calif.—p. 481.
Nitrogen Metabolism of Isolated Tissues of the Rat. H. Borsook and C. E. P. Jeffreys, Pasadena, Calif.—p. 495.
Formation of Fatty Acids from Glucose by Aspergillus Niger. C. F. Schmidt Jr., Rochester, N. Y.—p. 511.
The Ergot Alkaloids: V. Hydrolysis of Ergotinine. W. A. Jacobs and L. C. Craig, New York.—p. 521.

Journal of Bone and Joint Surgery, Boston

17: 531-826 (July) 1935

Radical Operative Treatment of Bone and Joint Tuberculosis. P. J. Erlacher, Graz, Austria; translated by W. P. Blount, Milwaukee.—p. 536.
Treatment of Giant Cell Tumors of Long Bones: (A) by Surgery; (B) by Irradiation. C. F. Geschickter, Baltimore.—p. 550.
Association of Intrathoracic Lesions with Bone and Joint Tuberculosis: Study of One Hundred Cases. C. M. Meng and H. I. Chen, Peiping, China.—p. 552.
*Treatment of Acute Purulent Arthritis by Joint Washing and Closure. H. T. Jones, Los Angeles.—p. 559.
*Treatment of Chronic Rheumatic Polyarthritis and Spondylarthritis by Parathyroidectomy. B. Schkurov, Kharkov, U. S. S. R.—p. 571.
Traumatic Separation of Medial Epicondyle of Humerus in Adolescence. J. Dunlop, Pasadena, Calif.—p. 577.
Cysts of Fibrocartilages of Knee Joint. H. Taylor, London, England.—p. 588.
Femoral Shortening for Equalization of Leg Length. J. W. White, Greenville, S. C.—p. 597.
Internal Derangement of Knee Joint. W. R. Bristow, London, England.—p. 605.
Knee-Flexion Deformity Following Poliomyelitis: Its Correction by Operative Procedures. R. E. Hughes, Los Angeles.—p. 627.
Spondylolisthesis Without Separate Neural Arch (Pseudospondylolisthesis of Junghanns). T. D. Stewart, Washington, D. C.—p. 640.
*Volkmann's Contracture. S. G. Jones, Boston.—p. 649.
Ischemic Paralysis from Pressure of Hematoma. G. M. Morrison and H. E. Kennard, Boston.—p. 656.
Ischemic Paralysis of Leg Simulating Volkmann's Contracture. S. G. Jones and F. J. Cotton, Boston.—p. 659.
Treatment of Congenital Equinovarus (Clubfoot). M. Forrester-Brown, London, England.—p. 661.
Treatment of Congenital Scoliosis Due to Hemivertebra. L. Mayer, New York.—p. 671.
Modification of Whitman's Treatment for Fracture of Neck of Femur. G. P. Mills, Birmingham, England.—p. 679.
Synergical Splint with Traction for Femoral Fractures. A. Hernandez-Ros y Codorniu, Murcia, Spain.—p. 682.
Use of Colloidal Sulphur in Treatment of Arthritis. T. Wheeldon, Richmond, Va.—p. 693.
Treatment of Fractured Neck of Femur by Axial Fixation with Steel Wires. D. R. Telson and N. S. Ransohoff, New York.—p. 727.
*Subcutaneous Spike Fixation of Fresh Fractures of Neck of Femur. F. J. Gaenslen, Milwaukee.—p. 739.
Destructive Spine Lesions: Diagnosis by Needle Biopsy. R. C. Robertson and R. P. Ball, Chattanooga, Tenn.—p. 749.
Adolescent Sacro-Iliac Joint Syndrome. M. H. Rogers and E. N. Cleaves, Boston.—p. 759.
Effect of Fractures on Blood Sugar. R. V. Funsten, University, Va.—p. 769.
Slipping Patella or Recurrent Dislocation of Patella. F. R. Ober, Boston.—p. 774.
*Correction of Rachitic Deformities by Preliminary Decalcification. H. Finkelstein, New York.—p. 780.
Calcification in Supraspinatus Tendon. E. N. Wardle, Liverpool, England.—p. 789.
Spontaneous Shelf Formation in Ununited Fracture of Neck of Femur. S. Selig, New York.—p. 792.
Local Anesthesia in Knee Arthrotomies. C. Rombold, Wichita, Kan.—p. 794.
Chair for Bilateral Ankylosis of Hip Joint. J. G. Kuhns, Boston.—p. 796.
Crêpe Paper Bandage versus Sheet Wadding Roll. A. J. Buka, Pittsburgh.—p. 798.
Spinal Pelvic Compression Brace. B. Koven and M. T. Koven, Brooklyn.—p. 800.
Ankle Joint Stabilization with Motion. P. M. Girard, Dallas, Texas.—p. 802.

Treatment of Acute Purulent Arthritis.—Jones reports eight cases and describes the method of treatment. After aspiration of the joint has given evidence of a purulent effusion and general and local symptoms have indicated more than a mild effusion, an incision is made into the joint. In the case of a knee, the incision is about 1 inch long, vertical and to one side of the proximal part of the patella. The joint is washed out carefully with physiologic solution of sodium chloride at 110 F., delivered through a catheter under moderate gravity pressure for a period of from twenty to thirty minutes. The joint is permitted to fill with fluid like a balloon and then to collapse, when the fluid is allowed to escape, carrying away pus, fibrin and other débris. An attempt is made to gain a water-tight closure of synovial membrane and capsule. Usually the skin also is closed. A cast is applied to afford rest to the joint and the progress is measured by noting the patient's general condition, the temperature, pulse, respiration, blood picture, urine and local symptoms and signs in the knee. The patients responded well to treatment. Trauma and a distant focus were closely related etiologic factors, causing the purulent arthritis in six of the eight patients. One cannot lightly dismiss

this relationship in a majority of the cases. In one case, in which osteomyelitis of the tibia developed associated with a septic knee joint, the septic tooth and the trauma to the region of the knee were both factors in the development of the osteomyelitis. One patient associated the onset of trouble with a very definite wrench to the knee while playing tennis, and he presented definite foci of infection. The surprising resistance of the synovial membrane to infection is illustrated by one case in which marked distention of the knee joint was discovered ten days after drainage of the adjacent tibia for osteomyelitis. The resistance of the synovial membrane to infection is probably associated with the bactericidal properties of the synovial fluid.

Treatment of Chronic Polyarthritis by Parathyroidectomy. — Schkurov investigated forty cases of chronic rheumatic polyarthritis and spondylarthritis treated by parathyroidectomy. Many of the patients were in the late stages of these diseases and had permanent deformities. Had parathyroidectomy been performed at an early stage, more satisfactory results would have been obtained. Parathyroidectomy cannot have any effect on the already ankylosed joints nor can it, without any subsequent orthopedic treatment, correct permanent deformities. Parathyroidectomy prevents the development of ankylosis, does away with rigidity of joints and creates the most favorable conditions for subsequent methods of correction of deformities and restoration of joint movement. The immediate results of this operation are good in almost all cases. Of the forty cases investigated, the late results proved to be good in twenty-two. This operation is only one means of prophylaxis and treatment of chronic rheumatic polyarthritis and spondylarthritis. In addition, it is essential to determine in each case the cause of illness and to outline a plan of treatment accordingly.

Volkmann's Contracture.—Jones found that certain elbow injuries, notably supracondylar fractures, are seen, together with a painful swollen elbow, an absent radial pulse and a cold anesthetic hand. If, after careful reduction, there is still diminished or absent radial pulse with loss of sensation of the hand, loss of voluntary motor power and pain in the elbow increasing hour by hour, Volkmann's contracture is impending. Immediate operation is necessary. The operation of choice is fasciotomy. The author states that Volkmann's contracture may occur in the absence of splints or tight bandages and that it is caused in certain cases by interruption of arterial circulation. This interruption may be due to direct injury to the artery itself or to intrinsic pressure on the artery caused by hemorrhage within the fascial envelop. The collateral circulation is sufficient if given an opportunity to function. The operation of fasciotomy, performed early, gives this opportunity.

Spike Fixation of Fractures of Neck of Femur.—Gaenslen used the following method for the reduction and subcutaneous spike fixation of fractures of the neck of the femur under scopolamine-morphine anesthesia in ten cases. Roentgenograms of the two hips in the anteroposterior view are taken with the sound hip rotated inward about 15 degrees to prevent a foreshortened appearance of the neck, due to anterior inclination. This view discloses the site and character of the fracture on the injured side and the normal angle of the neck and the shaft as well as the length of the neck on the well side. A lateral view of the sound hip is taken to determine the angle of anterior inclination. Previously prepared posterior plaster half shells are applied to the lower extremities, with the hips and knees flexed to right angles to provide muscular relaxation. Strong upward traction is made in the direction of the long axis of the femur. Lateral pressure on the trochanter is made to correct possible anteroposterior displacement. Reduction was completed by these maneuvers. Abduction is added to fix firmly or to lock the fragments and also to make possible the taking of roentgenograms in both anteroposterior and lateral views without shifting the patient's position. To facilitate introduction of the spikes, the hip is abducted to bring the neck parallel to the surface of the table and rotated inward sufficiently to allow for the anterior inclination of the neck, thus bringing the neck not only parallel to the table but perpendicular to the long axis of the patient. The skin is surgically prepared and a sterile, coarse netting is stretched over the affected hip and held taut by rubber bands to displace the heavy adipose layer. The trochanter limits are indicated on the skin surface by thrusting three hat pins into the hip region, parallel to the long axis of the neck, so that they pass tangentially over the anterior and posterior margins and the tip of the trochanter. With these pins to serve as landmarks, the cross section of the neck can be more readily visualized. This section is roughly 1.8 by 2.5 cm. in diameter. Into the center of this area two Kirschner wires are introduced about 1 cm. apart and to a depth of about 12 cm. The wires are identified with lead markers, and anteroposterior and lateral roentgenograms are taken. If the Kirschner wires are not satisfactory, efforts at more perfect reduction and insertion of guide wires are necessary. If the fracture surfaces overlap even slightly, the target is naturally reduced in size and the difficulties of spiking are materially increased. The first fixation spike is introduced through a tenotomy puncture wound and is drilled into the bone to a depth of from 3 to 4 cm. The spike is driven deeper with a mallet until its tip just engages the cortex of the head. If the placement of this spike is satisfactory, from two to four additional spikes are inserted. The hatpins and the two Kirschner wires are removed. The heavier fixation spikes are identified with lead markers and further roentgenograms are taken. These disclose whether the fragments are properly transfixed and whether the spikes are driven to the desired depth. If the position is satisfactory, the spikes are cut as short as possible. The skin is drawn over the ends and a dressing is applied over the puncture wounds. The patient is placed in bed with the leg resting on a pillow under the knee. Sling suspension may be added for comfort and to initiate active motion even on the first day. The spikes are removed in about three months. The author obtained good results in all cases.

Correction of Rachitic Deformities by Preliminary Decalcification.—Finkelstein treated fifty cases of rachitic deformities of the lower extremities by the following method: Roentgenograms and photographs are taken. In bilateral deformities of the lower extremities, a double plaster spica is applied from waist to toes. The patient is kept in bed. All antirachitic measures are suspended. After four weeks, another roentgenogram is taken and compared with the original to ascertain the degree of atrophy. The patient is then prepared for anesthesia. After the casts have been removed, the limbs are slowly bent into a slightly overcorrected position. Excessive force is contraindicated, and complete transverse fractures with displacement of fragments should be avoided. In multiple deformities, the tibias, the fibulas and the femurs can be corrected at one sitting. Extreme overcorrection of the deformities is unnecessary. Immediately after the correction, a double plaster spica is applied and, when the plaster is thoroughly dried, roentgenograms are again taken to determine the extent of improvement. Several days after the correction, general antirachitic measures are instituted, such as a high vitamin diet, cod liver or halibut liver oil with viosterol, calcium phosphate and exposure to ultraviolet rays. Massage and exercises are begun as soon as the roentgenograms show sufficient recalcification, and gradually increased weight bearing is encouraged. The results of treatment have been satisfactory. No major complications were encountered. The hospitalization period rarely exceeded ten days.

Journal of General Physiology, New York

18: 791-1010 (July 20) 1935. Partial Index

Relation Between Birth Weight and Litter Size in Multiparous Mammals. E. V. Enzmann and W. J. Crozier, Cambridge, Mass.—p. 791.
Modification of Temperature Characteristics: I. W. J. Crozier, Cambridge, Mass.—p. 801.
Studies on Blood Coagulation: III. Constancy of Hydrogen Ion Concentration During Coagulation of Fibrinogen by Thrombin. H. Eagle, Philadelphia, and J. P. Baumberger, San Francisco.—p. 809.
Id.: IV. Nature of Clotting Deficiency in Hemophilia. H. Eagle, Philadelphia.—p. 813.
Correlation of Viscosities of Protein Solutions with Their Ability to Crystallize. D. B. Hand, Ithaca, N. Y.—p. 847.
Solubilities, Apparent Dissociation Constants and Thermodynamic Data of Dihalogenated Tyrosine Compounds. P. S. Winnek and C. L. A. Schmidt, Berkeley, Calif.—p. 889.
Vitamin A in Eye Tissues. G. Wald.—p. 905.
Response of Single Visual Sense Cells to Lights of Different Wavelengths. C. H. Graham and H. K. Hartline, Philadelphia.—p. 917.
Significance of Structure of Membrane for Its Selective Permeability. W. Wilbrandt, New York.—p. 933.

Journal of Immunology, Baltimore

28: 413-496 (June) 1935

Adaptation of Staphylococcus Bacteriophage to an Artificially Produced Antibacteriophagic Serum. F. d'Herelle and M. L. Rakieten, New Haven, Conn.—p. 413.

Chemical Composition of Active Principle of Tuberculin: XIX. Differences in Antigenic Properties of Various Tuberculin Fractions: Adsorption to Aluminum Hydroxide and Charcoal. Florence B. Seibert, Philadelphia.—p. 425.

Desiccation of Serums and Other Biologic Products (Including Micro-Organisms) in Frozen State with Preservation of Original Qualities of Products So Treated. W. J. Elser, Ruth A. Thomas and G. I. Steffen, New York.—p. 433.

*Oral Immunization to Colds. G. E. Rockwell and H. C. Van Kirk, Cincinnati, and H. M. Powell, Indianapolis.—p. 475.

Relation of Heterophile Immunity to Incidence of Colds. G. E. Rockwell and H. C. Van Kirk, Cincinnati.—p. 485.

Oral Immunization to Colds.—Rockwell and his collaborators immunized a large group of persons orally to the secondary invaders of colds, using a vaccine made up of heterophile antibodies. The 500 patients who took the vaccine came from various walks of life and the 536 persons used as controls were chosen from the same environment. The average number of colds each patient had annually in the past three years, age, sex, occupation and allergic history was obtained before the vaccine was given. The oral cold vaccine was made from pneumococci and streptococci. Since the desired immunity was a nontype specific heterophile active immunity, a single pneumococcus strain was used. This strain was DR-I, a well known nonpassaged, and mainly rough, variant from the Neufeld type I pneumococcus. The streptococcus was a hemolytic mouse-virulent laboratory strain. The treatment consisted of the ingestion of one capsule of starch adsorbed vaccine containing 100 billion pneumococci and 100 billion streptococci with a half glassful of cold water each morning before breakfast for seven consecutive mornings, after which term one capsule each week was taken throughout the season. Of the 500 treated cases, thirty-eight had a history of continuous colds, while 425 had a history of from one to eight colds annually per person. Among the 536 controls, nine had a history of continuous colds, while 527 had a history of from only one to eight colds annually per person. Among the forty-seven patients who gave a history of continuous colds, the thirty-eight who were given the oral cold vaccine had, for that year, a total of only forty-one colds, thus passing from a stage of continual coryza to an average of 1.08 colds per person, while of the nine persons used as controls, only one reported a less severe type this year. Among those who for the past three years had a history of from one to eight colds annually per person, 462 patients, having a yearly average total during the previous three years of 1,400 colds or 3.03 colds per person annually, while taking the vaccine this year had a total of only 604 colds, or an average of 1.3 colds per person and 1.73 colds less per person, a decrease of 57 per cent. The 527 persons used as controls had a yearly average total, for the past three years, of 1,314 colds, or 2.49 colds per person annually. During the school year 1933-1934 this group had a total of 1,156 colds, or 2.19 colds per person, which is 0.3 cold less per person, or a decrease of 12 per cent. The essential decrease due to the oral cold vaccine is thus 45 per cent. The relationship between the response of the individual to the heterophile antigen and his incidence of colds is given in a separate article.

New York State Journal of Medicine, New York

35: 705-748 (July 15) 1935

Some Physical Aspects of Mental Disease. G. Zilboorg, New York.—p. 705.

Effect of Pollen Therapy on the Common Cold in Hay Fever Subjects. L. Sternberg, New York.—p. 713.

Value of "Cure Regimen" in Treatment of Coronary Disease: Critical Study. C. R. Comstock, H. D. Hunt and R. S. Hayden, Saratoga Springs.—p. 715.

Insulin in Malnutrition of Nondiabetic Children. A. Tow, New York.—p. 719.

Low Back Pain in Women. B. G. P. Shafiroff and A. F. Sava, Brooklyn.—p. 722.

Acute Suppuration of the Mediastinum. W. B. Farnum, New York.—p. 724.

Protein Therapy for Bacillus Ducrey Infections. D. O. Gorlin, New York.—p. 729.

Five Year Cures of Cancer: Report of Group of Cases. J. M. Swan, Rochester.—p. 731.

Oklahoma State Medical Assn. Journal, McAlester

28: 247-284 (July) 1935

Status of Lung Compression in Treatment of Pulmonary Tuberculosis. M. Rogers, Clinton.—p. 247.

Differential Diagnosis of Stones in Upper Urinary Tract. E. H. Fite, Muskogee.—p. 252.

Acute Appendicitis in Infants and Children. A. S. Risser, Blackwell.—p. 254.

Contact Dermatitis. R. L. Howard, Oklahoma City.—p. 259.

Sympathetic Ophthalmia. C. H. Haralson, Tulsa.—p. 262.

Philippine Islands Med. Association Journal, Manila

15: 305-348 (June) 1935

Iodaseptine Cortial (Iodobenzomethylformine) in Treatment of Chronic Amebiasis. C. M. Africa and E. Y. Garcia, Manila.—p. 305.

Further Observations on Course of Anesthesia Following Antileprotic Intradermal Injections. M. Lagrosa, J. O. Tiong and D. Disini, Culion.—p. 312.

Parenteral Administration of Fresh and Boiled Leprotic Emulsions in Lepers. M. C. Cruz, Culion.—p. 319.

Modified Abscission of Cornea (Keratectomy). A. R. Ubaldo and C. D. Ayuyao, Manila.—p. 324.

Plea for Unity and Cooperation. I. Villarica, Cebu, Cebu.—p. 326.

Science, New York

82: 19-46 (July 12) 1935

*Lumbar Localization of Paralysis in Experimental Poliomyelitis After Intranasal Inoculation. H. K. Faber, San Francisco.—p. 42.

Coccobacilliform Bodies Associated with Infectious Fowl Coryza. J. B. Nelson, Princeton, N. J.—p. 43.

Rôle of Lipoids in X-Ray Diffraction Patterns of Nerve. F. O. Schmitt and R. S. Bear, St. Louis, and G. L. Clark, Chicago.—p. 44.

Lumbar Localization of Paralysis in Experimental Poliomyelitis.—Faber experimented with intranasal inoculations of virus in fifty-seven monkeys to determine the region of initial paralysis. He believes that the infection beyond any reasonable doubt entered through the olfactory nerves and passed through the brain stem and spinal cord from above downward. Paralysis occurred first in the arms of twenty-five monkeys, in the legs of twenty-seven and in the arms and legs of five. These experiments, in which entrance of infection from the gastro-intestinal tract can be ruled out and in which the legs were more often first involved than the arms, demonstrate that initial involvement of the lumbar cord cannot properly be used as evidence for the theory of the gastro-intestinal portal of entry. They prove that the virus in descending through the cord can produce its first manifestations in the lower segments. Having observed that the virus is present in all levels of the cord including the cervical, before and when paralysis appears, the author explains the earlier and greater lumbar area paralysis by the fact that the anterior horn cell in that area are somewhat more susceptible than others to attack by the virus of poliomyelitis.

South Carolina Medical Assn. Journal, Greenville

31: 111-128 (June) 1935

Welch Bacillus Infections: Treatment by Autofiltrate Method. G. R. Dawson Jr., Charleston.—p. 111.

Southwestern Medicine, Phoenix, Ariz.

19: 223-260 (July) 1935

Some Remarks Concerning Clinical Pathology. L. O. Dutton, El Paso, Texas.—p. 225.

Hereditary Optic Atrophy (Leber's Diseases). H. L. Franklin, Phoenix, Ariz.—p. 227.

Missed Abortion. R. K. Smith, Tucson, Ariz.—p. 230.

Silicosis. G. Thorngate, Phoenix, Ariz.—p. 232.

Eye Problems of the General Practitioner. M. Green, San Francisco.—p. 236.

Census of Cases of Syphilis and of Gonorrhea Under Medical Care in New Mexico. M. J. Exner and W. Clarke, New York.—p. 241.

External Otitis. C. Gwinn, El Paso, Texas.—p. 243.

Granulocytopenia: Case Report. H. J. Felch, Phoenix, Ariz.—p. 246.

Tennessee State Medical Assn. Journal, Nashville

28: 271-314 (July) 1935

X-Ray as Aid to the General Practitioner. H. G. Reaves, Knoxville.—p. 271.

Disturbances of Labyrinth Causing Vertigo and Nausea. R. G. Reaves, Knoxville.—p. 278.

Clinical and Rehabilitation Aspects of Emphysema. K. Dunham, Cincinnati.—p. 284.

Review of Two Hundred and Ninety-Two Cases of Incomplete Abortions. D. W. Smith, Nashville.—p. 288.

The Problem of the Obese. E. G. Thompson, Memphis.—p. 292.

Ectopic Pregnancy. G. R. McSwain, Paris.—p. 296.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

47: 277-318 (July) 1935

Photodynamic Sensitization, Biologic Action and Therapeutic Application. A. Eidinow.—p. 277.

British Journal of Urology, London

7: 103-212 (June) 1935

Etiology of Urinary Calculus: Observations on Two Hundred and Eighty-Three Consecutive Personal Cases. H. P. Winsbury-White.—p. 103.

Effects of Syntropan, Enatin, Bromsalizol and Eupaverine on Human Ureter. K. Samaan and M. I. El Asreegy.—p. 116.

Necessity for Both Excretory and Retrograde Urography in Certain Cases. D. N. Eisendrath.—p. 124.

Some Landmarks in Surgery of Stone. E. W. Riches.—p. 140.

Technic for Difficult Urethral Stricture. T. J. D. Lane.—p. 148.

Epididymal Cysts, Their Etiology and Treatment. E. D. McCrea.—p. 152.

Unusual Cause of Rupture of Bladder. S. M. Vassallo.—p. 156.

Uremia Due to Aneurysm of Abdominal Aorta. T. G. I. James.—p. 157.

Gangrene of Penis and Scrotum as Surgical Emergency. J. C. Ross.—p. 158.

Ureteric Calculus of Unusual Shape: Case. A. W. Fawcett.—p. 161.

Indian Journal of Medical Research, Calcutta

22: 425-594 (Jan.) 1935

*Action of Anterior Pituitary Extract and Its Effect on Blood Sugar. K. Venkatachalam and A. N. Ratnagiriswaran.—p. 425.

Chemical Examination of Tylophora Asthmatica and Isolation of Alkaloids Tylophorine and Tylophorinine. A. N. Ratnagiriswaran and K. Venkatachalam.—p. 433.

Nuclear Division in Malarial Sporozoites. R. Knowles and B. C. Basu.—p. 443.

Blood Inhabiting Spirochete of Guinea-Pig. R. Knowles and B. C. Basu.—p. 449.

Observations on Pathogenicity of Local Strains of Spirillum Minus to Guinea-Pigs. N. G. Pandalai.—p. 469.

Short Note on Epizootic Among Rabbits Due to Salmonella Aertrycke. M. L. Ahuja.—p. 475.

Short Note on Viability of Bacterial Cultures. M. L. Ahuja.—p. 477.

Specificity of Antivenomous Serums, with Especial Reference to Serums Prepared with Venoms of Indian and South African Snakes. M. L. Ahuja.—p. 479.

Note on Williams' Modification of Eijkman's Test as Applied to Madras Waters. W. J. Webster.—p. 485.

Streptococcus Faecalis in Madras Waters. W. J. Webster.—p. 489.

Blood Groups and Heredity. P. N. Mitra.—p. 495.

Spectrographic Examination of Some Indian Milks. N. K. De.—p. 499.

Spectrographic Study of Vitamin A Content of Some Oils and Fats. N. K. De.—p. 509.

Observations on Chemistry of Oxytocin (Oxytocic Hormone of Pituitary Gland): Part IV. Action of Nitric Acid, Nitrous Acid and Sulphur Dioxide: Extractions with Pyridine, Ethyl Alcohol, Chloroform and Acetone. N. Das and B. C. Guha.—p. 517.

Vitamin A Values of Indian Fish Liver Oils Determined Biologically and Tintometrically. A. R. Ghosh and B. C. Guha.—p. 521.

Detoxication of Snake Venom by Photodynamic Action of Methylene Blue. H. E. Shortt and S. M. K. Mallick.—p. 529.

*Antirabic Immunization: Probable Lines of Progress in Improvement of Methods. H. E. Shortt, J. P. McGuire, A. G. Brooks and E. D. Stephens.—p. 537.

Rabies Fixed Virus as an Antigenic Agent When Inactivated by Photodynamic Action of Methylene Blue. H. E. Shortt and A. G. Brooks.—p. 557.

Studies on Protein Fractions of Blood Serums: Part II. Blood Serums of Opium Addicts. R. N. Chopra, S. N. Mukherjee and G. S. Chopra.—p. 561.

Id.: Part III. Malarial Serums During and After Rigor Stage. R. N. Chopra, S. N. Mukherjee and B. Sen.—p. 571.

Effect of Exposure of Suspensions of Rabies Infected Brain to Radiation from Quartz Mercury Vapor Lamp. G. Sankaran and W. A. Beer.—p. 581.

Effect of Anterior Pituitary Extract on Blood Sugar.—Venkatachalam and Ratnagiriswaran studied the general effects produced in the cat by the administration of anterior pituitary extract containing the growth promoting hormone. They found that the injection of 1 cc. of the extract, corresponding to 0.5 Gm. of the desiccated gland, reduced the blood pressure almost to zero and produced respiratory failure. If the quantity was given slowly and gradually, there was an initial fall of blood pressure followed by a marked and persistent rise and the animals could survive doses up to 15 cc. If this amount was exceeded, the animals died of convulsions and respiratory failure. The extract increased the blood sugar to nearly twice the normal value and this rise was enhanced by vagisection or atropinization. Vagisection or atropinization also produced a rise of blood sugar. Gonadal extracts reduce the blood sugar and counteract the rise due to the administration of anterior pituitary extract; this effect was not observed after vagisection or atropinization. The vagal center was made more sensitive to electrical stimulation by the administration of gonadal extract, whereas anterior pituitary extract had the opposite effect and it was less sensitive to electrical stimulus. The hyperglycemic effect of anterior pituitary extract has been shown to be the result of its depressant action on the vagal center. The authors are observing the mode of action of the anterior pituitary lobe on the vagal center and the results obtained so far indicate that the depressant action of the lobe may be due to the stimulation of the thyroid.

Antirabic Immunization.—Shortt and his collaborators describe the method of preparation, standardization, concentration of antirabic serum and the use of antirabic serum as an adjunct to treatment with phenolized dead virus, which they consider to mark an advance on the present methods of treatment by vaccine alone. Treatment by one dose of a combination of fresh living fixed virus and antirabic serum has been shown to have a considerable immunizing value although the main effect appears to have been exerted by the live virus, the serum being used mainly to render the use of the live virus more safe. They demonstrate that the use of fresh living fixed virus as an adjunct to treatment with phenolized dead virus is the most effective method yet tried for the immunization of dogs and, therefore, probably of other animals also. They believe that the future lines of advance toward the most efficacious means of producing a solid immunity against rabies will be along the path of utilization of antirabic serum and fresh live fixed virus, possibly combined with the use of a dead vaccine.

Indian Medical Gazette, Calcutta

70: 301-360 (June) 1935

Some Biochemical Observations on Asthma. Dharmendra and L. E. Napier.—p. 301.

Chemotherapeutic Studies on Plasmodium Infection in Monkeys: V. Action of Tebetren. R. N. Chopra and S. K. Ganguli.—p. 313.

Passage of Hookworms After Treatment. P. A. Maplestone and A. K. Mukerji.—p. 320.

Congenital Hydronephrosis Due to an Abnormal Attachment of Renal Fascia (of Gerota). V. Mahadevan and T. B. Menon.—p. 321.

Amibiarson in Treatment of Chronic Intestinal Amebiasis. R. N. Chopra, B. Sen and G. Sen.—p. 324.

Constants of Mustard Oil. B. B. Brahmachari.—p. 329.

Journal of Mental Science, London

81: 281-488 (April) 1935

The Sixteenth Maudsley Lecture: Physical Symptoms in Acute Confusional Insanity. L. C. Bruce.—p. 282.

Association of Physique and Mental Condition. J. L. Clegg.—p. 297.

Suggested Approach to Problems of Neuropsychiatry. D. N. Hardcastle.—p. 317.

*Interrelationships of Mental Disorders and Diabetes Mellitus. W. C. Menninger.—p. 332.

Achlorhydria in Psychoses, with Especial Reference to Coincident Anemia. Ruby O. Stern.—p. 358.

Depression: Normal and Abnormal. H. W. Eddison.—p. 370.

Mental Regulation of Intestinal Activity. J. M. Edwards.—p. 376.

Syndrome of Neurotic Anxiety: Somatic and Psychic Components of Its Genesis and Therapy. W. Misch.—p. 389.

Complement in Technic of Protein Therapy. J. R. B. Robb and L. Winkworth.—p. 415.

Mental Disorders and Diabetes Mellitus.—In studying the relationship between mental disorders and diabetes, Menninger observed thirty cases of mental disorder associated with diabetes, ninety-three cases of uncomplicated diabetes and 400 uncomplicated cases of mental disorder. The study covers the psychologic picture in diabetes, the types and courses of mental disorder associated with diabetes and the mental symptoms with hypoglycemia. He found that certain fluctuations of a specific type occur with sufficient frequency in diabetic persons to suggest a descriptive picture of the "diabetic personality." Diabetes does not determine the type of frank mental disturbance that may be associated with it, except in a small proportion of cases referred to as toxic psychoses or true "diabetic psychoses." That psychologic conflicts may be an important etiologic factor in many cases of diabetes seems probable. Gross psychologic trauma may initiate diabetes, but the more important unconscious conflicts might conceivably be the cause of the entire picture, even in these cases, and possibly operate in

some instances to produce diabetes in the absence of any external event or situation. Mental disorder and diabetes never occur independently in the same individual. They may occur independently at different times, but once associated they bear a relationship to each other.

Journal of Tropical Medicine and Hygiene, London

38: 145-156 (June 15) 1935

Dn. 7 in Treatment of Bilharzia Disease. F. G. Cawston.—p. 145.
Causal Organisms of Appendicitis. M. A. Gohar.—p. 146.
Some Observations on Pure Line Strains of Trichomonas Hominis and Trichomonas of Snake Natrix Erythrogaster (A Nonpoisonous Water-Snake). B. M. Das Gupta.—p. 148.

38: 157-168 (July 1) 1935

Ulcer Syndrome in Tropical Africa. A. A. F. Brown.—p. 157.
Nonchromogenous Anascospored Yeasts and Value of Fermentation Reactions in Order to Establish Their Botanical Position: Notes. M. Baeza.—p. 161.
Foreign Bodies in the Orbit. Vivian M. Métivier.—p. 163.

Lancet, London

1: 1483-1536 (June 29) 1935

The Unhappy Colon. A. F. Hurst.—p. 1483.
Bone Changes Simulating Tuberculosis or Tumor, with Especial Reference to Osteochondritis. J. F. Brailsford.—p. 1487.
Gonococcic Vaginitis in the Adult: Method of Isolating Gonococcus from Vaginal Secretion. A. J. King and W. N. Mascall.—p. 1492.
Development of Achlorhydria and Pyloric Stenosis in Cases of Carcinoma of Stomach. J. D. Robertson.—p. 1495.
Causation of Quinine Blindness. E. Wolff.—p. 1497.
Infantile Coxa Vara: Case, with Notes on Etiology. J. R. Armstrong.—p. 1498.
Further Observations on Digestibility of Common Foodstuffs as Determined by Radiography. W. C. D. Maile and K. J. L. Scott.—p. 1500.

2: 1-62 (July 6) 1935

Clinical Study of Headaches. E. Spriggs.—p. 1.
*Gold Treatment of Rheumatoid Arthritis. S. J. Hartfall and H. G. Garland.—p. 8.
Gold Treatment of Tuberculosis: Statistical Study. B. A. Peters and C. Short.—p. 11.
Postoperative Intracranial Thrombosis in Childhood. P. R. Evans.—p. 12.
Fat Necrosis Associated with Perforated Duodenal Ulcer. M. J. Smyth.—p. 15.
Fatal Case of Electrocution. A. H. D. Richmond.—p. 16.
*Incidence of Proctitis in Gonorrhea of Females. P. A. Clements and K. E. A. Hughes.—p. 18.
Erythrocyte Sedimentation Rate: Comparison of Methods Commonly Employed for Its Determination. G. E. Beaumont and J. W. Maycock.—p. 19.

Gold Treatment of Rheumatoid Arthritis.—According to Hartfall and Garland, chrysotherapy in relation to rheumatoid arthritis is still in the experimental stages. They treated 100 cases in two years with excellent results in 70 per cent and some improvement in 90 per cent of the cases. These included many cases of long duration with gross disability. Owing to the marked variation in susceptibility, no rules as to dosage can be laid down and treatment must be individualized. In some cases, treatment must be prolonged for two years or more. Probably the doses employed are still too large and it is possible that the interval between courses should be not less than three months. Toxic reactions occurred in fifty cases. These are usually mild and do not contraindicate further treatment. Hemorrhagic reactions and exfoliative dermatitis, however, may be fatal and no more gold should be given to patients who develop them. Other than gross renal or hepatic disease, the authors found no absolute contraindication to gold therapy before the onset of these serious reactions. Gold therapy should be undertaken only by those who are fully alive to its dangers. The patient should be warned of these possibilities. The urine should be tested before each injection. Special care must be taken after the occurrence of toxic reactions. It is essential that every patient should be seen every week during and for three months after each course of treatment.

Proctitis in Gonorrhea of Women.—Clements and Hughes investigated 160 patients suffering from gonorrhea of the genito-urinary passages or under tests of cure or under suspicion. Gonococci were found in the rectal secretion of sixty-nine. In the majority of cases, obvious signs and symptoms were absent. By cultural methods an important proportion of cases are discovered that would be overlooked if tested only by smear on microscopic slide. In eight cases under test of cure, gonococci were not found in the secretions of urethra and cervix either at the time of the rectal examination or later. In seven other cases examined under suspicion, no gonococci were ever found in secretions from the genito-urinary passages. Gonorrheal proctitis does not appear to be self limited. Treatment by irrigation with potassium permanganate (from 1:4,000 to 1:8,000) proved disappointing, but acriflavine hydrochloride 1:5,000 seemed satisfactory. Microscopic and cultural examination of the rectal secretion is clearly required for every woman in whom there is any question of a gonococcic infection.

Medical Journal of Australia, Sydney

1: 701-732 (June 8) 1935

*Diagnosis and Treatment of Lung Abscess. C. H. Fitts.—p. 701.
Suicide in Australia. S. J. Minogue.—p. 707.
Incidence of Rheumatic Infections in Australia: Note. E. L. Cooper.—p. 714.
Congenital Ectodermal Dysplasia. L. Dods.—p. 715.
Malrotation of Midgut Loop with Superimposed Volvulus: Case. P. L. Hipsley.—p. 716.

Diagnosis and Treatment of Lung Abscess.—Fitts states that acute lung abscess closely resembles bronchopneumonia. Cough in the early stages is not very characteristic, frequently the patient complains of a bad taste, and offensive breath is noticed after coughing. Dyspnea may be severe. Hemoptysis occurs in most cases, and rigors, sweats and high temperature may occur at one end of the scale; at the other, the constitutional symptoms and such signs as the temperature may be slight and intermittent. Physical signs of lung abscess are clubbing of the fingers, which sometimes occurs in association with subphrenic abscess, in which there is no communication with the thoracic cavity, widening of the palpebral fissures and a slight degree of exophthalmos. The sputum should be examined for tubercle bacilli, anaerobic organisms, spirochetes, hydatid hooklets, amebas or sulphur granules of Actinomyces. There is no single feature, even to the duplicity of the roentgenograms, that may not be common to lung abscess and carcinoma of the lung. By blockage of a bronchus, bronchiectasis may be set up distal to the growth, and this may develop into a bronchiectatic abscess. Abscess formation may occur in the growth itself, or in some slow growing tumors in the parenchyma of the lung central necrosis and cavity formation may take place. Sometimes empyema is diagnosed on physical signs and exploratory puncture, the pus being aspirated from a lung abscess. A roentgenogram would prevent this mistake. Septic bronchopneumonia may terminate cases of lung abscess in the acute stage. Empyema may complicate it and death may occur from toxemia. Cerebral abscess may occur even in the chronic abscesses in a late stage and seems to be more frequent after operative intervention. The author advocates complete discharge of the abscess contents through the related bronchus and closure of the cavity. A chronic cavity in the lung is a potential source of danger from recurring infection, hemoptysis and secondary bronchiectasis in the neighboring portions of the lung and from cerebral abscess. Medical treatment of lung abscess should be continued until the patient is definitely going down hill, until the successful evacuation and closure of the cavity occur or until such time as it is obvious that the cavity is not going to close. If the patient is definitely going down hill, surgical intervention may be life saving. Pleural adhesions are first promoted with an extrapleural iodine pack. A week later an exploratory puncture is made and, when pus is found, a track is produced by diathermy along the needle, which has been left in place. Bronchial fistulas are always present, and often, after closure of the cavity, a fresh pocket forms. Chronic cavities are difficult to close. Some of them are said to be lined with stratified epithelium. When there are widespread bronchiectases and not a very large cavity, thoracoplasty may be necessary. For chronic abscess suitably situated, whether or not there is secondary bronchiectasis, lobectomy should be seriously considered. Artificial pneumothorax should be looked on as a means of closing a cavity that is not too thick in the wall or as a means of controlling hemoptysis. In some cases there is grave danger of rupture into the pleural cavity and of the development of pyopneumothorax. The author believes that every chance should be given the patient to close the cavity by postural and bronchoscopic drainage whenever possible and that operation should be performed only when these fail.

Chinese Medical Journal, Peiping

49: 397-506 (May) 1935

Nature and Treatment of Congestive Heart Failure: I. Clinical Picture and Its Physiologic Pathology. F. R. Dieuaide.—p. 397.
Surgical Treatment of Trigeminal Neuralgia and Description of Case of Tumor of Gasserian Ganglion Successfully Removed in Moukden Medical College Hospital. C. Chang.—p. 412.
Osteomyelitis of Mandible: Observations of Etiology, Pathogenesis and Diagnosis. J. J. Wolfe.—p. 422.
Cysticercosis Cellulosae in Man, with Especial Reference to Involvement of Central Nervous System. H. L. Chung and C. U. Lee.—p. 429.

49: 507-608 (June) 1935

Nature and Treatment of Congestive Heart Failure: II. Prevention and Treatment. F. R. Dieuaide.—p. 507.
Pathology and Treatment of Joint Sprain. L. J. Miltner, C. H. Hu and H. C. Fang.—p. 521.
*Preliminary Observations on Longevity of Infective Larvae of Wuchereria Bancrofti Cobbold in Culex Pipiens Variety Pallens Coquillett. S. M. K. Hu.—p. 529.
Suprapubic Drainage of Bladder: Its Indications, Contraindications: Method of Accomplishing It. J. Gray.—p. 537.

Longevity of Larvae of Wuchereria Bancrofti Cobbold in Culex Pipiens.—Hu found viable infective larvae in the labia of two mosquitoes sixty-eight days after the fourteen days of incubation. The infective larvae of Dirofilaria immitis were found to be able to survive for a considerable period in the mosquito host. Of a batch of Culex pipiens mosquitoes infected on a filarial dog, the last positive mosquito dissected sixty-seven days later was found with two infective larvae moving about actively in its labium as well as one other living infective larva in its abdomen. The intensity of infestation of Culex pipiens mosquitoes in the Shanghai area was found to be affected by the abundance of microfilariae ingested by the mosquito at the time of infection. Of forty-eight positive Culex pipiens mosquitoes experimentally infected on a patient lightly infected with filariae, the average number of infective larvae per mosquito was 3.9, whereas of twenty-nine Culex pipiens mosquitoes experimentally infected on a patient heavily infected with filariae the average intensity of infestation was 14.4. As many as forty-three living infective larvae were found in a single Culex pipiens mosquito that had been allowed to feed only once on a patient heavily infected with filariae. Anopheles punctipennis was found experimentally to be a good carrier of the dog filaria, as the average number of filariae per mosquito was about 23.5. Some of the experimentally infected mosquitoes, which were found with infective filarial larvae of Dirofilaria immitis in their labia and abdomen, were used for these observations. Some Anopheles punctipennis mosquitoes infected about twenty-four days previously and found harboring infective Dirofilaria immitis larvae in their labia and abdomens were allowed to feed on a dog. Of the three infective mosquitoes in this batch which had bitten the dog, two were found to be still harboring some infective larvae in their abdomens, although all their labia were now negative for infective larvae. Two infective larvae were found remaining in the abdomen of one mosquito, while another still contained six infective larvae in its thorax and one in its abdomen. The third mosquito was found with one infective larva still in its thorax. These mosquitoes were still likely to be infective to dogs, as their supply of filarial larvae had not been exhausted by their first bite after the incubation period of their parasites had been completed. The ability of a mosquito to serve as a suitable host for a heavy infection of Wuchereria Bancrofti larvae may vary with the kind of mosquito, as indicated by Hicks. Many specimens of Culex pipiens heavily infected with matured larvae survived for a considerable length of time. An engorged Culex pipiens mosquito dissected on the third day after feeding on a filarial subject was found harboring four Wuchereria Bancrofti larvae of an early sausage form and twenty-three infective larvae. The infective larvae of this mosquito were doubtless filariae that were ingested during an earlier blood meal rather than filariae in the blood meal taken three days before the specimen was dissected. Those in the sausage form were likely to have been filariae taken along with the blood meal on the day the mosquito was captured. Multiple infections of a susceptible mosquito may thus increase its supply of parasites considerably. In mosquitoes with several broods of filarial larvae, infective larvae of an earlier brood which had not escaped from their mosquito host may be harbored along with those of a later brood.

Annales d'Anatomie Pathologique, Paris

12: 621-744 (June) 1935

Zone of Myoneural Junction or Motor Plaque in Normal and Pathologic State. R. Noël and B. Pommé.—p. 621.
Experimental Contributions to Study of Hydronephroses. E.-C. Craciun and D. Zanne.—p. 643.
*Anatomic and Physiopathologic Study of Lung Infarcts of Embolic Origin: Rôle of Vasomotor Nervous System. J. Delarue, L. Justin-Besançon and P. Bardin.—p. 681.

Experimental Lung Infarcts of Embolic Origin.—Delarue and his co-workers studied experimental pulmonary embolism. At first they used enamel beads of from 1 to 8 mm. diameter injected into the external right jugular vein. After the dog had been anesthetized the vessel was dissected free for about 5 cm. and the superior extremity ligated. It was opened for from 0.5 to 1 cm. and the orifice maintained by a fine cannula, by means of which twenty beads having the maximum caliber of the vein could be introduced. The beads were pushed by the thumb to the retroclavicular junction of the jugular vein, after which the central end of the jugular was tied. All operations were performed aseptically. The animals were killed at varying intervals: immediately, fifteen minutes, thirty minutes, one hour, twenty-four hours, forty-eight hours, seven days, fifteen days, three weeks, one month, and three months later. The immediate result is an intense congestion of a large zone of pulmonary parenchyma. After some hours the lesion appears more circumscribed, while the diffuse congestion is less marked. Intra-alveolar hemorrhages become the predominating lesion. The typical hemorrhagic infarct is not present until after forty-eight hours. This is a massive and homogeneous bloody infiltration of one or more pulmonary lobes. Little by little after a dozen days the limits of the lesion become demarcated until it is surrounded by a practically intact pulmonary parenchyma. At the same time local hemolysis or sclerosis is observed appearing in the region of hemorrhagic infiltration. Further investigations showed that section of the left vagosympathetic trunk in the dog and unilateral section of the pneumogastric or of the sympathetic in the rabbit produce disseminated congestive pulmonary lesions, hemorrhages and edema. All these facts offer evidence in favor of the hypothesis that hemorrhagic infiltration of the pulmonary parenchyma is above all the effect of a sudden capillary vasodilatation of reflex nervous origin in a limited territory, followed by hemorrhage by erythrodiapedesis.

Annales de Médecine, Paris

38: 1-116 (June) 1935

*Early Uremic Nephritides of Scarlet Fever. A. Lemierre.—p. 5.
*Disorders of Dextrose Metabolism in Nephritis. F. Rathery.—p. 18.
Action of Primary Octylic Alcohol (Octanol) and of Certain Negative Tension Bodies on Kidney. A. Clerc, J. Sterne and R. Paris.—p. 32.
Experimental Study of Dechloridation. L. Ambard, J. Stahl and D. Kuhlmann.—p. 46.
Polypeptides of Blood in Nephritis. P. Cristol.—p. 58.
Pure Renal Form of Spirochetosis. J. Celice and M. Albeaux-Fernet.—p. 70.
Evolution of Lipoid Nephrosis Toward Uremia. P. Vallery-Radot, P. Delafontaine and J. Trombert.—p. 79.
Experimental Nephritis Obtained by Injection of Rabbit with Streptococcic Filtrates. P. Vallery-Radot, M. Derot, and Mlle. P. Gauthier-Villars.—p. 100.

Early Nephritis of Scarlet Fever.—Lemierre studied scarlet fever patients from the standpoint of urea retention. He concluded that there is a frequent renal involvement coinciding with the eruptive phase of scarlet fever. This renal involvement is usually silent, and measurement of the blood urea is the only method of discovering it. It may be slight and indicated only by a moderate uremia. If more intense, it causes a more accentuated and persistent rise in blood urea. In this case it may be accompanied by extreme oliguria almost equivalent to scarlatinal anuria, which occurs later. In the course of early uremic nephritis, hypertension is always absent; albuminuria is rare, and if it exists it is late and transitory. Edema appears only under exceptional circumstances. These characters contrast with those of the nephritides of convalescence in which albuminuria, hematuria, edema and arterial hypertension are present, apparently unrelated to the level of blood urea. The prognosis of these early nephritides is benign. In the fatal cases that the author has observed the termination has been due more to the scarlet fever itself than to the renal involvement.

Dextrose Metabolism in Nephritis.—Rathery studied the free and protein-bound sugar of the blood plasma in more than 250 patients with nephritis. He distinguishes three groups of hyperproteinglycemia—slight, around 1.2 Gm.; average, from 1.2 to 2 Gm., and high, above 2 Gm. Urea determinations were also made on these patients. The question raised is whether hyperproteinglycemia has a special prognostic significance different from that of uremia. It is certain that in severe cases the level of urea and protein-bound sugar take the same upward course, but it is not so in all cases. An average uremia with a normal protein-bound sugar indicates in general the existence of a serious renal lesion, but the prognosis is relatively favorable. Inversely, a protein-bound sugar relatively high with a practically normal blood urea level indicates that the kidney itself is not profoundly affected but that the organism is not defending itself well. Hyperproteinglycemia persisting in the course of a chronic nephritis is in general a worse prognostic sign than the degree of uremia. No relations exist between the level of free sugar and protein-bound sugar. Normal or below normal free sugar concurrent with elevated protein-bound sugar is frequently observed. There seems also to be no relation between hyperproteinglycemia and renal acidosis. Systematic study of the variations in protein-bound sugar in the nephritic patient is a valuable aid in measuring the intensity of the metabolic disorder. It acquires for this purpose a special importance and a significance entirely different from that of elevated blood urea.

Presse Médicale, Paris

43: 1017-1040 (June 26) 1935

*Early Diagnosis of Malignant Chorio-Epithelioma. A. Brindeau, H. Hinglais and M. Hinglais.—p. 1017.
Sudden Death in Serofibrinous Pleurisy. J. Troisier, M. Bariéty and H. Brocard.—p. 1019.
Surgery of Middle Turbinate in Treatment of Headaches. G. Departout.—p. 1023.
Rest Tremor or Intention Tremor? R. Nyssen and R. Dellaert.—p. 1024.

Early Diagnosis of Chorio-Epithelioma.—Brindeau and his co-workers studied systematically the luteinizing factor of the anterior pituitary-like principle present in the blood serum of women who had evacuated a mole. Twenty-three cases of mole without subsequent malignant condition and four followed by malignant conditions were studied. They believe that these observations allow the early and rapid diagnosis of postmolar chorio-epithelioma. They conclude that the disappearance of the gonadotropic hormone from the blood does not occur at a constant rate or follow a regular rhythm identical in all cases. The prolonged period of hormone elimination and the consequent persistence of a positive Zondek reaction does not necessarily indicate the malignant evolution of the molar rests. The authors' method is based on the curve of a series of regular titrations of the luteinizing factor of anterior pituitary-like principle made on the blood serum during the six or twelve weeks following expulsion of a mole. Ordinarily the amount present decreases progressively at varying rates. This conclusion is based on three facts: 1. The presence of a chorio-epithelioma is accompanied by the luteinizing factor. 2. The quantity of this factor secreted is in direct relation to the vitality and abundance of the plasmodial elements. 3. The rapid and precise titration of the factor is possible by using the rabbit. In the twenty-seven cases discussed, the four positive results were histologically verified. Finally, in the authors' experience, the reappearance of the hormone after its complete disappearance has never been observed.

Schweizerische medizinische Wochenschrift, Basel

65: 653-672 (July 20) 1935

Hypomania and Vitality. O. Hinrichsen.—p. 653.
Treatment of Seborrheal Conditions with Hydrochloric Acid and Pepsin Preparations. M. A. Schoch.—p. 656.
*Rare Forms of Osteomyelitis. R. Meyer-Wildisen.—p. 658.
Copper in Its Biologic and Therapeutic Significance. Von Linden.—p. 660.
Experiences with Ramon's Prophylactic Vaccination Against Diphtheria. M. Frey.—p. 662.

Rare Forms of Osteomyelitis.—Meyer-Wildisen points out that osteomyelitis usually attacks the lower extremity, chiefly the femur, and that it is generally caused by Staphylococcus pyogenes-aureus. This report shows that osteomyelitis may attack other bones and may be caused by other micro-organisms. He discusses three cases. In one patient the second metatarsal was involved, in another the proximal phalanx of the middle finger, and in the third the femur. In the latter case it appears probable that typhoid was the cause of the osteomyelitis. The patient had typhoid twenty-one years before this attack of osteomyelitis. During the period of convalescence from typhoid she had had severe pains in the right thigh, and these pains had recurred from time to time. The present attack of osteomyelitis developed following overexertion. The pus of the osteomyelitic abscess was free from typhoid bacilli and also from other micro-organisms. The author says that the pus has been known to be sterile in other cases in which typhoid is the cause. He considers this case a relapsing osteomyelitis of typhoid origin. Traumatic origin was evident in the case in which the osteomyelitis was localized in the finger, but no such cause could be detected in the case in which the metatarsal was involved. In this case further inquiry disclosed that several months before the onset of the suppuration in the foot the patient had had a varicella-like disorder. Since the vesicles of varicella are readily infected by the staphylococcus, it is assumed that the accidental infection of the impetiginous pustules was the cause of the osteomyelitis.

Clinica Medica Italiana, Milan

66: 507-595 (June) 1935

*Importance of Yeast in Metabolism of Carbohydrates. V. G. Barone.—p. 507.
Treatment of Mercuric Chloride Poisoning. F. Serio and I. Capizzi.—p. 523.
Single Cyst of Kidney: Case. M. Umberto.—p. 540.
Spleen in Chronic Lead Poisoning. A. Fontana.—p. 559.

Yeast in Metabolism of Carbohydrates.—Barone reviews the literature on the action of yeast on the metabolism of carbohydrates and reports his results from the administration of fresh yeast to normal persons and diabetic patients. In both groups the author's results proved that fresh yeast has a hypoglycemic action if given by itself, a decreasing action on the hyperglycemia provoked by the administration of dextrose and galactose if given simultaneously with these sugars, and a remarkable although transient increasing action on the alcohol in the blood if given simultaneously with dextrose. The author concludes that his results justify further clinical investigations by giving yeast to diabetic patients with the aim of ascertaining its possible therapeutic applicability in the disease.

Policlinico, Rome

42: 325-376 (June) 1935. Surgical Section

*Bleeding Breast: Case. A. Bellini.—p. 325.
Primary Adamantinoma of Fisher's Type (So-called Malpighian Epithelioma) of Osteomyelitic Tibia: Case. A. Casini.—p. 338.
Encephalocele: Case. M. Contestabile.—p. 352.
Benign Angiomatous Tumors of Skeletal Muscles. G. Zappalà.—p. 367.

Bleeding Breast.—Bellini reports four cases of bleeding breast caused by an intracanalicular papilliferous fibro-adenoma in the first case, an intracanalicular epithelioma degenerating into pericanalicular epithelioma in the second, and an intracanalicular hemorrhagic cystic epithelioma in the third. Biopsy or operation was not performed in the fourth case. The author says that the treatment should be based on the results of the biopsy without giving any importance to data of relative value, such as the duration of the development of the disease and the age of the patient; but, having in mind the frequency with which bleeding breasts degenerate into precancer or cancer, he advises resorting to a total mammectomy with emptying of the axillary space in all suspected cases of cancerous degeneration.

Semana Médica, Buenos Aires

42: 1-72 (July 4) 1935. Partial Index

Surgery in Pulmonary Tuberculosis: Results. R. A. Izzo, O. P. Aguilar and H. D. Aguilar.—p. 1.
Psychologic Significance of Laughter in Dementia Praecox. A. Raitzin.—p. 40.
*Partial Amputation of Cervix Uteri in Chronic Cervicitis. E. A. Boero.—p. 48.
Technic for Electrocardiograms. J. Comas.—p. 54.

Partial Amputation of Cervix in Chronic Cervicitis.—Boero thinks that chronic cervicitis in women around 40 years of age is a prodrome in the development of cancer of the

cervix indicating the removal of the infected area. He uses a modification of the Sturmdorf operation, the original technic of which was illustrated in THE JOURNAL, Nov. 27, 1926, page 1802. In this modification he does not use the flap of a partial mucosa to cover the denuded area after removal of the pathologic tissues, and he makes a discission at the commissures of the external orifice of the uterus. His technic is as follows: With the patient in the lithotomy position and under local or parametrial anesthesia, the cervix is exposed. The anterior and posterior lips of the cervix are grasped by two four-tooth forceps placed at the commissural line, and the cervix is pulled down toward the vulva. A Hegar dilator of the same caliber as that of the cervical canal is introduced through the canal down to the bottom of the uterus to keep the canal dilated during the operation. While traction is made on the cervix by the forceps and the dilator held in the left hand, a sharp and pointed bistoury is introduced at a point 2 or 3 mm. within the healthy tissue and the entire glandular area surrounding the cervical canal is coned out. The cone excision extends up to the internal os. The incision leaves a conic cavity of normal muscle and conjunctive tissue. The surfaces of the cavity bleed slightly. The commissural points of the lips are then grasped with the same kind of forceps and wedge-shaped pieces of cervical tissue are removed. The superior and inferior lips are then folded by two lines of catgut sutures in each lip and the denuded surfaces are brought in apposition to form the new neck. A raw area that remains about the internal orifice after the operation deserves no attention, since it is spontaneously epithelialized shortly after. A packing of gauze impregnated with iodoform ends the operation. The new cervix, after the operation, looks like the opened bill of a duck; a few months later its shape improves and the orifice looks like that of a primiparous woman. The operation is not advisable in young women who desire children.

Beiträge zur Klinik der Tuberkulose, Berlin

86: 289-342 (June 25) 1935. Partial Index

*Does Intracutaneous Injection of Tuberculin with Subsequent Control of Differential Blood Picture Make Possible a Differentiation Between Active and Inactive Tuberculosis? H. Decker.—p. 291.
*Significance of White Blood Picture in Its Relationship to Sedimentation Speed of Erythrocytes in Clinical Evaluation of Some Forms of Pulmonary Tuberculosis. J. Leitner.—p. 297.
Endopleural Photography. A. Gullbring.—p. 309.
Spontaneous Pneumothorax Developing on Same Side on Which Seven Years Before an Exudative Pleurisy Had Existed. L. Vajda.—p. 312.
Rapid Diagnosis of Tuberculosis by Direct Injection into Lymph Nodes of Guinea-Pigs. E. Piasecka-Zeyland.—p. 328.

Differentiation of Active and Inactive Tuberculosis.—Investigations on the differential blood count following the Pirquet reaction conducted by Engel and Ockel and the studies of Bredeck on tuberculin and the blood differential count in the diagnosis and classification of tuberculosis induced Decker to give his attention to this problem. He adhered largely to the method employed by Bredeck, but he injected only 1 mg. of old tuberculin and examined the blood picture shortly before and twenty-four and forty-eight hours after the injection. In order to reduce the errors, 500 leukocytes were counted in each cell count. An increase in the staff cells was disregarded unless it was at least 4 per cent in forty-eight hours, and in the case of lymphocytes 5 per cent was considered the minimum. Lesser changes were considered within the margin of error. The author made the test on fifty patients with demonstrated active tuberculosis, three patients with renal tuberculosis, fifty persons without tuberculosis and eighteen patients who formerly had had tuberculosis but in whom clinical examination now gave no indications of activity of the process. In all patients with active tuberculosis, the tuberculin injection was followed by an increase in the staff cells and the lymphocytes were decreased in twenty-nine, remained unchanged in seventeen and were increased in four. It is noteworthy that the staff cells were increased even in hopeless cases, in which the defense powers seemed to be exhausted. Two of the three patients with renal tuberculosis reacted with an increase in the staff cells, while in the third one there was only a reduction in lymphocytes. The fifty nontuberculous control persons disclosed no change in the staff cells after the tuberculin injection. The eighteen persons who had recovered from pulmonary tuberculosis likewise had no change in the staff cells, while the number of lymphocytes remained unaltered in fourteen and was increased in the other four. The author reaches the conclusion that, if a patient with normal blood picture or with one that has shifted to the left, and for which no other explanation can be found, reacts to an intracutaneous injection of 1 mg. of old tuberculin with an increase in the staff cells, this is an indication of the presence of active tuberculosis. A decrease in the lymphocytes probably has the same significance.

Leukocyte Count and Sedimentation Speed in Tuberculosis.—Leitner reports the results of comparative studies on the sedimentation speed of the erythrocytes and on the white blood picture in 137 cases. Of 109 patients with active tuberculosis, ninety-two, or 84.3 per cent, had a shifting to the left of the neutrophils, whereas this shifting to the left was lacking in seventeen cases, or 15.7 per cent. The sedimentation reaction was normal in thirty-five cases (32.1 per cent) and was increased in seventy-four (67.9 per cent). This shows that the sedimentation test failed more often than the white blood count. In ten patients who in the beginning had a normal sedimentation speed there was later an increase, so that in serial sedimentation tests the number of failures was reduced to twenty-five (22.8 per cent). Of twenty-six patients with inactive tuberculosis, only two showed an increased sedimentation speed and an altered blood picture (7.6 per cent). If, in addition to the neutrophils, the other cell types are considered, pathologic blood changes are demonstrable in a still higher percentage of cases of active tuberculosis. In some instances even the red blood picture may be valuable for the diagnosis (observation of the reticulocytes), but the behavior of the monocytes, eosinophils and lymphocytes is more important. The monocytes are always an indication that the tuberculous process has not yet come to rest but that the organism is still in the defense phase. The outcome of the defense is indicated by the status of the neutrophils or lymphocytes. Contrary to former opinions, eosinophilia is not a sign of cure but always a symptom of activity, for it occurs also in hyperallergic reactions. Moderate lymphocytosis does not necessarily signify a curative phase, but characteristic lymphopenia as a rule indicates severe, active tuberculosis. The subsequent lymphocytosis is favorable and indicates an improvement, usually a tendency to latency. Changes in the leukocytes, in the form of toxic granules or nuclear pyknosis, likewise are of some diagnostic significance. The diagnostic possibilities are further enhanced by combining the study of the blood picture with the tuberculin test. The author thinks that Schilling's blood count is more practical for clinical use than Arneth's count, the latter being too complicated. He recommends the combined use of the sedimentation test and the analysis of the blood picture.

Deutsche medizinische Wochenschrift, Leipzig

61: 1145-1184 (July 19) 1935. Partial Index

New Method for Treatment of Female Sterility Caused by Hypofunction of Genitalia. C. Clauberg.—p. 1149.
*Some Aspects of Meinicke's Clarification Reaction and Remarks on Serodiagnosis of Syphilis. F. Koch.—p. 1153.
Erroneous Diagnoses in Shoulder Pains. B. W. Ercklentz.—p. 1155.
*Treatment of Rheumatic Disorders with Snake Venom. A. Burkardt.—p. 1159.

Meinicke Clarification Reaction.—Koch states that in his clinic the Meinicke clarification reaction has been employed in approximately 36,000 cases. He thinks that the micromethod of the clarification reaction is valuable, for it is rapid. However, it has been known to fail, particularly in strongly positive serums, a factor to which Meinicke himself has called attention. This is not caused by a lack of sensitivity but rather by the great sensitivity, and Meinicke has advised the dilution of the serum with sodium chloride solution in such cases. The author found this unnecessary, because other reactions insured the diagnosis in these cases. In analyzing twenty-seven cases in which the Meinicke clarification reaction had failed he found that failure was most frequent in cases of congenital syphilis and in patients with the late forms of syphilis, especially with aortic syphilis and dementia paralytica. He advises that in these cases other serologic tests should be made in addition to the Meinicke clarification reaction. Since the withdrawal of a sufficient amount of blood may be difficult in nurslings,

the author thinks that puncture of the superior sagittal sinus by way of the large fontanel will yield a sufficient amount of blood, and he states that this intervention is comparatively simple.

Treatment of Rheumatic Disorders with Snake Venom.—Burkardt discusses the chemistry and toxicology of snake venoms and calls attention to former therapeutic experiences with snake venom, particularly in thrombopenia and in the control of pain in malignant tumors and in sciatica, neuralgias, tabes dorsalis and so on. In these conditions the chief advantage of venom therapy lies in the fact that it does away with the use of morphine, so that the patients have a better appetite and their physical and psychic resistance is better. Körbler noticed that an arthrosis of the hip joint improved considerably following the administration of snake venom, and he assumed that the venom not only reduces the pain but also influences the metabolic processes. In view of these observations and after several years of experience with bee venom in the treatment of rheumatic disorders, the author decided to try snake venom in the hope of overcoming certain disadvantages of the use of bee venom. He thought that the possibility of using larger doses might improve the results and that with a less expensive product the venom therapy might become possible for a larger number of patients. He administered the venom by intracutaneous injection and was almost always able to counteract the pain in seventeen cases of sciatica and various forms of neuralgia. In secondary chronic articular rheumatism the results were not convincing, but then the number of cases was rather small. At any rate, in some cases with acute exacerbations with swelling, pain and reddishness of several joints, three or four treatments were quite effective. In primary chronic arthropathy, improvement could be obtained in three fourths of the cases; the general condition, the joints and the sedimentation speed of the erythrocytes indicated improvement. In the gonorrheal and tuberculous arthritides, the articular swelling and the pains were considerably improved in eight of ten cases. Improvement was produced also in four cases of spondylitis. Even in degenerative arthroses the results were gratifying.

Klinische Wochenschrift, Berlin

14: 1017-1056 (July 20) 1935. Partial Index

Linkage of Chemical Processes in Muscle. I. K. Parnas.—p. 1017.
Studies on Allergic Diseases: Causal Therapy of Asthma and Hay Fever. F. E. Haag.—p. 1024.
*Corpus Luteum Hormone and Castration Hypophysis. W. Hohlweg.—p. 1027.
Origin and Nature of Wassermann Reagins. I. Györffy and K. Lissák. p. 1028.
*Cerebrospinal Fluid in Whooping Cough. W. Bayer.—p. 1032.

Corpus Luteum Hormone and Castration Hypophysis.—Hohlweg demonstrates that the corpus luteum hormone does not prevent the development of castration changes in the anterior lobe of the hypophysis. His experiments were made on castrated female rats. The animals were given daily 540 micrograms of crystallized corpus luteum hormone (progesterone). This quantity is twice the daily dose for adult rabbits, but it did not prevent the development of the hypophyseal changes that are characteristic of castration.

Cerebrospinal Fluid in Whooping Cough.—Bayer demonstrates that the cerebrospinal fluid shows pathologic changes in a relatively large number of children with whooping cough. These changes concern the pressure, the quantity, the number of cells, the quantity of protein, the mastic curve and the blood-cerebrospinal fluid barrier. These changes may be present and may be severe, even if there are no indications of nervous complications; they indicate pathologic changes in the meninges. It is difficult to find a satisfactory explanation for the changes in the cerebrospinal fluid, but it may be assumed that toxic influences are responsible, as in other infectious diseases. However, in whooping cough it is likely that certain mechanical factors likewise play a part. The author calls attention to the repeated pressure fluctuations in the cranium caused by the paroxysms of coughing. He was able to observe in a number of children an increase in the intracranial pressure during the attack of coughing and he found that the pressure of the cerebrospinal fluid increased by from two to three times the original value. These increases in pressure are of short duration and probably are due chiefly to the venous stasis that develops during the attack of coughing. The pressure in the cerebrospinal fluid subsides again together with the venous stasis; that is, immediately after the attack of coughing. It is probable that these recurrent pressure fluctuations exert an unfavorable influence on the cells of the cerebral meninges and on those of the brain. The development of edemas can be explained on the basis of such mechanical influences. Moreover, the cells that have been impaired by mechanical influences are of course more sensitive to toxic influences.

Medizinische Klinik, Berlin

31: 933-964 (July 19) 1935. Partial Index

*Etiology of Tear of Interarticular Disk. F. Linde.—p. 942.
*Craniocerebral Iontophoresis and Transcerebral Dielectrolysis in Functional and Organic Cerebral Disorders. H. Ehrenwald.—p. 943.
Influence of Nutrition on Constitution of Organism. R. Berg.—p. 947.
Self Purification of Rivers. R. H. Francé.—p. 950.

Etiology of Tear of Interarticular Disk.—Linde discusses whether the tear of the interarticular cartilage of the knee joint, which is a rather frequent complaint in miners, is always traumatic or whether it may be the final result of a wearing away of the cartilage, as the miner frequently has to work on bended knees. The author accepts the traumatic origin and points out that, if the wearing away was the cause of the tear, it should occur with considerable frequency not only in miners but also in other occupations that require working in the kneeling or squatting position. However, in many of these occupations other disturbances, such as bursitis, develop, but tearing of the interarticular cartilage is not associated with this. Therefore it seems logical that in the miner's occupation some other factor besides the kneeling must play a part in the development of the tears in the interarticular cartilage. The author thinks that the use of pneumatic tools plays an important part in the development of the tears, for the miner uses these tools either in the kneeling position or while his knees are partly bent. He shows how this may influence the menisci. He thinks that the development of impairments of the menisci in ski runners and mountaineers does not disprove the part played by the pneumatic tools in miners, for the concussions and vibrations to which the knees of mountaineers and ski runners are exposed under certain conditions largely resemble the concussions produced by pneumatic tools.

Craniocerebral Iontophoresis in Cerebral Disorders.—Ehrenwald describes his method of craniocerebral iontophoresis. He saturates a piece of cloth or blotting paper, 15 by 7 cm. in size, with an urticariogenic substance (such as histamine or acetylcholine), puts under it a piece of lead or zinc foil of proper size and fastens it at the hair line on the forehead or the neck. Another metal foil with a dampened base serves as a cathode on the opposite side. The histamine was used in a concentration of 1:5,000. The galvanic current of from 4 to 5 milliamperes is passed through for about five minutes. The active substances exert their influence from the positive pole. With this treatment the author obtained favorable results in all forms of angiospastic circulatory disturbances of the brain, such as migraine, habitual anemic headaches of neurotic patients and some symptoms occurring in patients with hypertension (headache, vertigo and tinnitus).

Münchener medizinische Wochenschrift, Munich

82: 1143-1184 (July 19) 1935. Partial Index

Serotherapy During Diphtheria. H. Kleinschmidt.—p. 1143.
Anal and Rectal Prolapse and Its Treatment. A. Mühling.—p. 1156.
Selective Action of Short Waves. J. Kowarschik.—p. 1158.
*Treatment of Exophthalmic Goiter with Large Doses of Vitamin A. H. Wendt.—p. 1160.
Critical Evaluation of Stationary and Centrifugal Sedimentation Method on Basis of Comparisons. Holzapfel.—p. 1163.

Treatment of Exophthalmic Goiter with Large Doses of Vitamin A.—Wendt says that several years ago Abelin found that experimental hyperthyroidism could be improved or entirely counteracted by a special diet with a high vitamin content. Later others found that vitamin A is a direct antagonist of the incretory product of the thyroid. The author tried vitamin A in the treatment of hyperthyroidism. The patients

were given three times daily 30 drops of a vitamin A concentrate obtained from fish livers. In three patients with exophthalmic goiter this treatment produced a considerable increase in weight and a reduction in the basal metabolism to almost normal values, and it seems to promise favorable results in two other cases of exophthalmic goiter. It appears that the vitamin A therapy is most effective in mild cases and in cases of average severity. Cases of exophthalmic goiter caused by iodine, which as a rule are not readily influenced, likewise seem to yield to this treatment.

Strahlentherapie, Berlin

53: 193-360 (June 29) 1935. Partial Index

Further Experiences with Protracted Fractional Roentgen Irradiation in Carcinoma of Female Genitalia. H. Kirchhoff.—p. 193.
*Treatment of Malignant Tumors with Concentrated Fractional Roentgen Irradiations Applied from Short Distance. H. Chaoul.—p. 202.
*Short Distance Roentgen Irradiation in Gynecology. W. Schaefer.—p. 210.
Radiologic Treatment of Esophageal Carcinoma. R. Hummel.—p. 225.
*Continuous Roentgen Irradiation of Cancer by Means of "Superteleroentgentherapy." G. G. Palmieri.—p. 247.
Contribution to Casuistics on Roentgen Carcinoma. R. Müller.—p. 261.
Biologic Action of Filtered Sunlight (Experiments on Plants). H. Amende.—p. 308.

Treatment of Malignant Tumors with Fractional Roentgen Irradiations.—Chaoul points out that the superiority of radium therapy over roentgen therapy is not so much due to the character of the rays as to the manner of application. For this reason attempts have been made by Holthusen and others to devise a method of roentgen irradiation the action of which resembles that of radium rays. The author worked with a modified roentgen method that applies the rays to small fields. The focal skin distance is generally 5 cm., the tension 60 kilovolts and the filter 0.2 mm. of copper. In this manner the depth dose is somewhat greater than is generally the case in radium contact irradiation, but the author sees in this an advantage of the treatment. He administers daily from 300 to 400 roentgens. The irradiation time is rather short, for, with a minute flow of from 100 to 150 roentgens, the 300 or 400 roentgens can be applied in about two minutes. The total dose varies between 4,000 and 8,000 roentgens. This amount is applied within a period of from two to four weeks. If in the course of the irradiations dark red erythemas develop, accompanied by a loosening of the epidermis, it is advisable to interrupt the irradiations. Generally the reactions after this form of short distance irradiation resemble those of Coutard's method. The modification of the tumor often becomes manifest in the course of the treatment, and, if this is the case, high doses may be dispensed with. Caution is necessary if the patient has previously been irradiated by some other method, because there is danger of necrosis. For the same reason the author rejects the combination of this short distance irradiation with some other form of roentgen irradiation. He considers the treatment indicated in the same cases in which contact or implantation radium therapy would be employed. So far the treatment has been used in 146 cases, among which were all forms of skin carcinomas and carcinomas of the lip, the oral cavity, the parotid, the breast and the rectum, the latter following resection of the coccyx and opening of the intestine. The author stresses the advantages of this treatment in cases in which it is impossible to obtain adequate amounts of radium.

Short Distance Irradiation in Gynecology.—Schaefer administers x-rays from a short distance by means of a special x-ray tube that can be introduced into the body cavities. This tube is constructed like a Lenard tube, except that, instead of the thin window that allows the passage of cathode rays, this tube has thicker metal, which does not permit cathode rays to escape and serves as an anode. This tube in combination with suitable filters permits the localization of the rays on the tumor and the preservation of the normal tissues. The author stresses the following as the advantages of the treatment: 1. The skin is not impaired, because the rays are applied directly to the tumor. 2. As the result of the short focus distance and of the filter action, the spatial dose is small and the surrounding healthy tissues (intestine and bladder) are not impaired. 3. The method makes possible a separate irradiation of the parametrium with larger doses than were formerly possible. 4. In case of recurrence the method permits the application of large doses in patients in whom the skin would not tolerate large doses. The author employed the treatment especially in inoperable tumors of the cervix uteri. He usually introduces radium into the tumor, so that from 3,000 to 4,000 mg. element hours is applied. Then he irradiates the small pelvis from the outside by means of an x-ray tube suggested by Martius, which insures an even distribution of the rays and preserves the tissues. Finally he applies a separate irradiation to the parametrium by means of the tube that can be introduced into body cavities. At a 5 cm. distance from the filter, from 2,000 to 2,500 roentgens is applied to the pelvic wall. In some patients the use of radium and the external irradiation were dispensed with and only the x-ray tube for use in body cavities was employed. It was found that the primary tumor was destroyed just as if radium had been used and that the infiltrates in the parametrium disappeared completely. Nevertheless, the author thinks that it is advisable to combine internal with external irradiation.

Continuous Roentgen Irradiation of Cancer.—The roentgen method suggested by Palmieri permits the simultaneous irradiation of several patients at a distance of from 4 to 5 meters. The irradiation intensity is slight and can be compared with that of radium therapy. The main purpose of the method is to imitate radium therapy in its time factor, as the author thinks that the chief advantage of radium therapy is its selectivity, which is due to the fact that the radium is employed continuously for long periods. He points out that his "superteleroentgentherapy" somewhat resembles the so-called telepanirradiation employed by Heublein in New York. He describes his apparatus, which permits the simultaneous application of x-rays to four patients, the cabins in which the patients are placed during the irradiation and the arrangement and measurement of the doses, the marking off of the fields and the method of filtration. The treatment was employed in cancers of the oral cavity, the upper air passages, the esophagus, the stomach, the lung, the uterus and the skin. In some instances the results were gratifying, but complete cure was not effected in any of the cases.

Wiener Archiv für innere Medizin, Vienna

27: 159-318 (July 6) 1935. Partial Index

Prodromal Symptoms of Phthisis. A. Kirch.—p. 159.
*Modification of Epinephrine Hyperglycemia by Preceding Diet and Insulinization. R. Boller and K. Makrycostas.—p. 179.
Dehydration in Addison's Disease and Its Mechanism. G. Marañón and J. A. Collazo.—p. 189.
Diagnosis of Latent Diseases of Cardiac Muscles. A. Leimdörfer.—p. 215.
*Dissociated Bile Retention. L. Mitow.—p. 241.

Modification of Epinephrine Hyperglycemia.—In persons without metabolic disturbances, Boller and Makrycostas investigated to what extent certain diets or insulinization during the preliminary period influence epinephrine hyperglycemia. They state that the blood sugar curve following an injection of epinephrine is not changed by the diet given during the period preceding the epinephrine injection. However, chronic insulinization during the preliminary period increases considerably the action of epinephrine on the blood sugar. It was found in several cases that this increase is most noticeable when insulinization is done while the person receives a diet deficient in carbohydrates. An epinephrine injection during a dextrose tolerance test demonstrates that the increased permeability of the liver for sugar following a diet deficient in carbohydrates or following insulinization can be throttled.

Dissociated Bile Retention.—Mitow says that Lemierre and Brulé in 1910 called attention to the so-called dissociated bile retention, which was ascribed to the fact that the hepatic cells are not always impaired in the same manner, in that in some instances they retain all bile constituents, in others only the bile salts and in others only the bile pigments. In the author's clinic it was assumed that the problem could be cleared up if the duodenal juice was examined in the doubtful cases. If the theory of Lemierre and Brulé is correct, it might be expected that, if the bile salts are absent from the urine of patients with jaundice, they should be present in the duodenal

juice, in which they are carried with the bile. If there is no dissociation, if the bile salts are destroyed somewhere in the organism or are retained, or if they are not even formed, they will not be found in the duodenal juice. The author studied this problem on patients with various types of jaundice. He reaches the conclusion that Lemierre and Brulé were right when they spoke of a dissociated bile retention.

Zeitschrift für Kinderheilkunde, Berlin

57: 289-382 (July 6) 1935. Partial Index

Distribution of Phosphorus Compounds in Blood of Man and Animals. H. Nissen.—p. 289.
*Erythema Nodosum in Scarlet Fever. E. Moro.—p. 321.
Serum Disease: Influence of Serum on Water Exchange in Patients with Tuberculosis. L. von Kostyál.—p. 326.
*Total Calcium Content of Blood in Normal and Spasmophilic Children. S. Siwe.—p. 368.

Erythema Nodosum in Scarlet Fever.—Moro stresses that during childhood cases of erythema nodosum may appear that have no connection with tuberculosis. He reports a case that developed during scarlet fever and in which repeated tuberculin reactions were negative. He emphasizes that the notion of erythema nodosum of childhood as a sure symptom of tuberculosis should be abandoned. Erythema nodosum in scarlet fever nearly always appears during the third or fourth week; that is, during the same critical period during which such complications as late lymphadenitis, hemorrhagic nephritis, secondary anginas, the true scarlet fever relapse, late synovitis and late endocarditis develop. Schick considered these manifold "after diseases" of uniform pathogenesis and the manifestation of a "period of specific predisposition."

Calcium of Blood in Spasmophilic Children. — Siwe studied the total calcium content in normal and spasmophilic children. He determined the calcium values of blood specimens withdrawn in the morning and in the evening. In normal cases he found regular curves at a high level. In spasmophilic cases the curves indicate considerable instability; there are great differences between the morning and evening values and there are irregular increases and decreases in the total values. In patients with spasmophilia who have convulsions the calcium level is usually rather low, but the sudden changes are more characteristic than the low values. In the patients in whom convulsions developed during the time they were under observation, considerable reductions always appeared suddenly followed by more or less pronounced increases in the total calcium values. The author thinks that these sudden fluctuations explain the so-called exceptional cases, in which high calcium values are observed during spasmophilic convulsions, for the calcium value in such cases depends entirely on the time of withdrawal of the blood specimen. No other factor is necessary to explain these cases. Although convulsions seem to develop at the time of considerable reductions in the calcium content, they do not necessarily or regularly develop at these times. The author concludes that the determination of the total calcium content of the serum can never definitely exclude spasmophilia, even if the result indicates practically normal values.

Zeitschrift für klinische Medizin, Berlin

128: 223-342 (June 25) 1935. Partial Index

Kymographic and Electrocardiographic Studies on Disturbances in Cardiac Rhythm. W. Brednow and B. Deppe.—p. 223.
*Venesection in Treatment of Erythremia. F. Reimann and A. Breuer. —p. 238.
Congenital Dilatation of Pulmonary Artery. L. E. Przywara.—p. 260.
*Complete Sinus Block with Branch Block in Myocarditis. H. Marzahn. —p. 270.
Disturbances in Blood Perfusion of Right Coronary Artery. G. W. Parade.—p. 273.
*Pathogenesis, Clinical Aspects and Surgical Treatment of Spontaneous Hypoglycemia. M. Schur and M. Taubenhaus.—p. 292.

Venesection in Treatment of Erythremia.—According to Reimann and Breuer it is generally believed that venesection is of only slight value in the treatment of erythremia. They cite reports which indicate that, although venesection has been resorted to in erythremia, it has been rarely made use of in a systematic and well planned manner. They were induced to try systematic venesection in the treatment of erythremia by observations in a case of erythremia in which severe hemorrhages resulted in anemia. They employed venesection in the treatment of seven cases of true erythremia. As a rule the venesections were made twice weekly, from 300 to 400 cc. being withdrawn each time. This treatment was continued for several weeks. During this time the patients were kept under constant control as regards the blood status as well as the general condition. When the hemoglobin had decreased to from 80 to 90 per cent the venesections were discontinued, but the patient was still kept under clinical and hematologic control. The withdrawal of the relatively large quantities of blood was nearly always well tolerated. After the third or fourth venesection the patients generally reported considerable improvement. The external characteristics of erythremia, such as redness of the skin and of the mucous membranes, improved and the subjective complaints in the form of headaches, rushing of the blood to the head, vertigo, tinnitus aurium, fainting, palpitation of the heart and others disappeared. The authors think that the success of the venesection is chiefly due to the fact that the substances, such as iron, which the organism requires for blood formation, are removed to a considerable extent and the pathologically increased blood formation is inhibited. The vascular system is relieved of its surplus load; the overfilling of the organs with blood is reduced and their normal functioning is thus improved. After the venesection treatment, a tendency to remission frequently becomes noticeable and this improves the action of the blood withdrawal. The effects of the venesection therapy persisted for approximately two years. In comparing the results of venesection with other therapeutic methods that are successfully employed in erythremia, particularly with roentgen therapy and the use of phenylhydrazine, the authors found that venesection is equivalent to these.

Complete Sinus Block with Branch Block in Myocarditis.—Marzahn reports the history of a patient in whom a rare combination of cardiac defects occurred. In the course of a subacute myocarditis following influenza, a complete sinus block concurred with a branch block of the right side. The patient died from acute pulmonary edema. The auricular waves were absent in all three leads of the patient's electrocardiogram, which indicated an atrioventricular automatism of relatively high frequency. The author assumes that juxtasinusal, supranodal inflammatory degenerative changes were the eliciting cause of the abnormal stimulus formation in the atrioventricular node, for on the basis of the anatomic observations, particularly in view of the multiple necroses that interspersed the entire bundle, such changes seem probable. Inflammatory changes in the region of the sinus node must have interrupted the conduction between the sinus node and the auricle. The branch block is sufficiently explained by the necroses and the indurations.

Spontaneous Hypoglycemia.—Schur and Taubenhaus show that the symptoms of spontaneous hypoglycemia resemble largely those of insulin shock. There may be slight discomfort, a feeling of hunger, profuse sweating and tremor, or coma and convulsions. The authors mention three conditions that may produce spontaneous hypoglycemia: (1) increased insulin formation resulting either from a quantitative increase in the islands of Langerhans or from a hyperfunction of these islands, (2) a disturbance in the counterregulation by hormones and (3) a disturbance in the mobilization of the glycogen. They concede that there are a number of cases in which nothing can be found that would explain the attacks of hypoglycemia. Formerly the treatment of hypoglycemia was largely limited to the attempt to prevent the reduction in carbohydrates by the frequent administration of small amounts of carbohydrates. The single administration of large quantities of carbohydrates was avoided so as to prevent hyperglycemic attacks. The authors admit that the administration of small amounts of carbohydrates is only a symptomatic treatment which does not counteract the cause of the disorder, but they think that this treatment is sufficient for the milder cases. They say that the surgical treatment, which was first suggested by American authors, should be resorted to when an adenoma or a carcinoma of the islands of Langerhans exists or when there are inflammatory disorders in the biliary passages. The surgical intervention itself, as far as it concerns the pancreas, should be limited to the removal of the tumor.

The authors consider the resection of normal portions of the pancreas inadvisable. They cite a case in which they opened the abdomen in the belief that an insular adenoma existed, but, when no neoplasm was found, the abdomen was closed again. It was found that after this laparotomy the attacks of hypoglycemia ceased. The authors are unable to explain this peculiar effect but point out that the result of this laparotomy is practically the same as that achieved by resection of portions of the pancreas. They report a second case in which surgical correction of disorders of the biliary tract resulted in a disappearance of the attacks of hypoglycemia.

Zentralblatt für Chirurgie, Leipzig

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*Etiology and Histology of Nonspecific Chronic Epididymitis. J. Jordans. —p. 1634.
Contribution to Jedlička's Surgical Method in Case of Pancreatic Cysts. E. Polák.—p. 1641.
Bleeding Jejunal Varices. W. Latten.—p. 1643.

Nonspecific Chronic Epididymitis.—Jordans points out that the majority of authors designate the gonorrheal, syphilitic and tuberculous forms of epididymitis as specific and apply the term nonspecific to all other forms of epididymitis. Many clinicians are of the opinion that the nonspecific epididymitis, as a rule, takes a chronic course. The author says that the surgical specimens which are sent to a pathologic institute for examination are nearly always from chronic or at least from subacute cases. He made studies in seventy-nine cases. Practically all age groups were represented in this material and he was unable to corroborate the opinion of a higher incidence of nonspecific epididymitis in the age group that follows puberty. He says that many investigators consider a urethrogenic and a metastatic pathogenesis but reject a purely traumatic origin. In cases in which an involvement of the spermatic cord can be demonstrated, urethrogenic continuous inflammation is generally assumed. However, involvement of the spermatic cord is often missing and in such cases some authors are inclined to assume a metastatic infection, while the majority believe that the origin is likewise urethrogenic. The author points out that mild forms of inflammation are readily overlooked in the specimens and are discernible only if microscopic inspection is made. Thus there arises the question whether cases of deferentitis may not be overlooked when the changes are slight. The author decided to examine the spermatic cords in the twenty cases of nonspecific epididymitis in which material was available. He detected a deferentitis of intracanalicular origin in eighteen of these cases, which again indicates a urethrogenic pathogenesis. The microscopic examination of seventy-nine surgically removed epididymides disclosed that nonspecific chronic epididymitis is localized particularly in the caudal portion of the epididymis and that it develops by the canalicular route. The author discusses the differentiation of nonspecific epididymitis from the tuberculous and the gonorrheal form.

Zentralblatt für Gynäkologie, Leipzig

59: 1681-1744 (July 20) 1935

Artificial Cervical Endometrioses. O. Frankl and L. Kraul.—p. 1683.
Carcinomatous Cyst of Uterus. H.-E. Eichenberg.—p. 1686.
Another New Method for Tubal Sterilization. H. Hinselmann.—p. 1689.
*Does Anemia Exist in the New-Born in Case of Placenta Praevia? K. Heising.—p. 1691.
Surgical Experiences in Enforcement of Law for Prevention of Defective Offspring. G. Kleff.—p. 1700.
Results of Treatment of Sterility. E. C. Lork.—p. 1705.

Does Anemia Exist in the New-Born in Placenta Praevia?—The observation that the infants of mothers with placenta praevia have an anemic appearance induced Heising to compare the hemograms of these with the hemograms of normal new-born infants. He detected an anemia in eight of twenty-seven new-born infants from mothers with placenta praevia. In the most severe case of anemia the hemoglobin value was approximately 52 per cent below the average for the normal new-born, and the erythrocytes 45 per cent below the normal. The author points out that his observations corroborate the opinion expressed by Stoeckel and Zangemeister to the effect that in placenta praevia not only does the mother bleed profusely but also the infant may bleed.

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Investigations on Syphilitic Aortitis. C. Müller.—p. 673.
*Gaucher's Disease: Three Cases. A. Kveim.—p. 696.
*Fate of Our Eclampsia Patients During Subsequent Pregnancies and Deliveries. S. Kjelland-Mørdre.—p. 712.
*Poisoning with Blue Rocket Larkspur: Case. A. Jakobsen.—p. 725.
Rat Bite Fever: Case. G. Benestad.—p. 729.
Colchicine Treatment of Malignant Tumors in Mice: Control Investigation. K. T. Poulsson.—p. 735.
*Angiomatosis of Brain and Trigeminal Region with Intracranial Calcification and Epilepsy. E. H. Schiøtz.—p. 737.
Clinical Roentgenologic Contribution to Question of Pathogenesis of Open Pulmonary Tuberculosis. A. H. Brinchmann.—p. 758.
Ring Shadows on Roentgenogram of Lung. A. H. Brinchmann.—p. 765.
Traumatic Pneumothorax on Basis of Rupture of Lung. H. C. Wennevold.—p. 770.

Gaucher's Disease.—Kveim has found thirty-four cases of this disease in the literature. In his three personal cases, in a sister and two brothers aged 23, 28 and 26, there were considerable enlargement of the liver and spleen, leukopenia and thrombopenia, an increased sedimentation reaction, a tendency to bleeding, partly with subperiosteal hemorrhages, marked petechiae with consequent hemochromatosis, especially of the lower extremities, and brown coloration of the skin, mostly of the uncovered parts of the body. In the young woman pronounced changes in the bones also appeared, with typical wine bottle shape, chloasma-like spots on the face and yellow spots in the sclerae, and histologic examination of the bone marrow revealed the characteristic picture of Gaucher's cells. In this case a hitherto undescribed symptom also was present; namely, an almost black coloration of the instep and the leg almost up to the knees, directly dependent, the author avers, on the hemorrhagic diathesis, the special localization being due to mechanical and static reasons.

Fate of Eclampsia Patients.—Of sixty-one cases of eclampsia in forty-eight patients, nine were without symptoms. Of the fifty-two remaining cases, thirty were complicated with recurring intoxication of pregnancy (eighteen with albuminuria, five with eclampsism, seven with eclampsia), grave in fourteen cases. Premature detachment of the placenta occurred in three instances, the fatal case representing the only death in the material. Of forty-nine of the offspring, thirty-six (twenty-eight mature) were alive and viable and eleven (one mature, seven viable) were stillborn, most of them macerated. Kjelland-Mørdre emphasizes that, while the question of interrupting the new pregnancy must be decided for each individual case, interruption is usually not necessary.

Poisoning with Blue Rocket Larkspur.—Jakobsen says that the case resembled intoxication with an aconite alkaloid. The active substance was probably the alkaloid delphinine. He ascribes the comparatively mild effect to the use of extract of the root of the rocket larkspur instead of the seeds, which contain the main quantity of the alkaloid. Treatment was the same as for intoxication with aconite.

Angiomatosis of Brain and Trigeminal Region.—In Schiøtz's case of epilepsy, the first symptoms set in before the sixth month of life. The patient, a man aged 44, had a vascular nevus of the face, the extent of which corresponds approximately to that of the first branch of the trigeminal nerve on the right side. The roentgenogram of the head shows numerous gyroform calcified lesions, partly with double contours, their seat corresponding to the right lobe of the occiput. The author states that the combination of vascular nevus of the trigeminal region, telangiectasis of the pial vessels and glio-angiomatosis of the brain with debility or epilepsy (most often contralateral jacksonian epilepsy), or with both, is a special syndrome first clinically described in 1879 by Sturge. As the hemangiomas have a tendency to calcification, they become visible in the roentgenogram. He has collected eighty-six cases from the literature. Of the total eighty-seven cases, fifty-eight have been verified at necropsy, roentgenologically or operatively. The time of the appearance of the first symptom is known in sixty cases; in forty this was at the age of 1 year or earlier, in twelve between 1 and 10, and in eight cases later than 10. Of seventy-six patients, fifty-three were men and twenty-five women. The pathologic anatomy is reviewed with especial reference to Volland and Krabbe, who show that the calcifications lie in the cerebral cortex, not in the pia mater.